

Hail as hazard: changing attitudes to crop protection against hail damage in France, 1815–1914^{*}

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Abstract

French peasants were accustomed to confronting environmental hazards such as droughts, storms and floods as well as diseases afflicting their crops and livestock. Their insecurity of living had traditionally been countered by a fatalism fostered by the Church. During the nineteenth century, scientific knowledge undermined the traditional role of popular religion and encouraged farmers to embrace a rational form of risk management, that of commercial or mutual insurance. This paper considers how French peasants addressed the specific hazard of damage to crops by hailstorms between 1815 and 1914. It examines the transition from ringing church bells to ward off storms to reliance on formal insurance but it also touches on attempts to divert or mitigate storms using hail cannon. It refers particularly to the middle Loire Valley *département* of Loir-et-Cher within the general context of France as a whole. It also compares the growth of hail insurance with that of livestock insurance. It concludes by briefly comparing the situation in France with that in England.

French peasants were accustomed to confronting both man-made and natural hazards, both edicts of governments and acts of God. Against the many threats they faced, both cultural and natural, individual peasants had traditionally sought group protection within the immediate family and the proximate rural community, but also in the more remote Church. The insecurity of life for many in rural France at the beginning of the nineteenth century had long been countered by a peasant fatalism fostered by the Church. The peasants' sense of helplessness when facing natural disasters, of their subordination to natural forces, was linked to a popular religion whose practices were interpreted as providing some assurance and protection against the many adversities which could befall them, their families and their properties. When such protection failed, as it often did, religion encouraged a fatalistic acceptance of those adversities as 'acts of God'. During the early modern period, hailstorms were interpreted by European Christian theology as divine retribution, as proof of God's omnipotence and of his punishing people for their sins. From the eighteenth century onwards, ideas from the Enlightenment and the associated growth of science came to challenge paternalistic religion. Attitudes towards natural hazards saw belief in a traditional deity replaced by faith in a modern rationality. Hail

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came to be perceived as a natural hazard, a risk that might be better managed by a logical policy of insurance than by prayerful attempts to appease a deity.¹ This paradigm shift in attitudes is directly observable in the writings of the educated elite but can only be detected in a partially literate peasantry by examining the extent to which they purchased insurance.

This paper adds to the 'extremely limited' number of historical studies dealing with the risk of hail and its management.² Eugen Weber's classic study of the transformation of peasant *mentalités* in France between 1870 and 1914 narrated vividly the decline of religious influence in the countryside but ignored the role of insurance as an alternative to religious practices as risk management.³ Similarly, even the seemingly comprehensive (and certainly extensive) portrayal of the French peasantry between 1789 and 1914 edited by Maurice Agulhon and Robert Specklin paid scant attention to agricultural insurance. It referred only briefly to the development of livestock insurance societies after 1904 and merely noted in a single sentence the existence of a smaller number of societies providing protection against damage to crops by hail.⁴ This neglected phenomenon in the history of French agriculture merits more attention.

I

Peasant conservatism may be understood as a way of managing risk: keeping to the known when facing the unknown. John Berger has described the peasantry as 'a class of survivors'.⁵ His empathetic view of the peasantry sees it as a group which recognizes a world of scarcity rather than of surplus, a world of uncertainties, risks and dangers that not all of them survive. As Berger has expressed it, 'the path through the future ambushes is a continuation of the path by which survivors from the past have come ... The path of that tradition is handed down by instructions, example and commentary'.⁶ Popular religion played a key role in that process. Rogation processions through the fields, as portrayed in Jules Breton's painting *La bénédiction des blés en Artois* of 1857 were one means of seeking divine protection against droughts and storms.⁷ Wayfare crosses (*calvaires*) erected throughout the French countryside had the same purpose. More precisely targeted was the practice of ringing church bells to provide protection against damage to crops by storms.

In his 'naturalist' portrayal of the peasantry on the Beauce plateau between Chartres and Orléans in the mid-nineteenth century, *La Terre* (1887), Emile Zola described vividly the devastation that a hailstorm could very quickly wreak upon crops. The storm's impact was

¹ F. Oberholzner, 'From an act of God to an insurable risk: the change in the perception of hailstorms and thunderstorms since the early modern period', *Environment and History* 17 (2011), pp. 133–52.

² F. Mauelshagen, 'Sharing the risk of hail: insurance, reinsurance and the variability of hailstorms in Switzerland, 1880–1932', *Environment and History* 17 (2011), pp. 171–91; U. Lübken and C. Mauch, 'Uncertain environments: natural hazards, risk and insurance in historical perspective', *Environment and History* 17 (2011), pp. 1–12.

³ E. Weber, *Peasants into Frenchmen: the modernisation of rural France, 1870–1914* (1977).

⁴ M. Agulhon and R. Specklin (eds), *Histoire de la France rurale*, III, *Apogée et crise de la civilisation paysanne* (1976), p. 418.

⁵ J. Berger, 'A class of survivors', *New Society* 42 (1977), pp. 611–3; J. Berger, *Pig Earth* (1979), p. 200.

⁶ Berger, *Pig Earth*, pp. 195–213; quotation from p. 203.

⁷ Musée des Beaux Arts, Arras, France.

highly localized, affecting some but not all properties in the (fictitious) commune of Rognes, nor nearby communes. Some of Zola's peasants saw the storm as an act of God, punishment for their sins; some prayed to God while the storm raged, some screamed their rage against God. Others were resigned to the hazard, seeing it as a 'senseless, haphazard calamity', no longer believing 'in an avenging Lord who sent the wind and the hail and the thunder'. Their doctor, visiting to attend a patient, solemnly but perhaps somewhat ingratiatingly and exaggeratedly declared 'What a misfortune, what a terrible misfortune. There's no greater misfortune for the farmer'.⁸ In Lucien Fabre's evocative historical novel *Le Tarramagnou* (1925), set in the viticultural Midi in the early 1900s, a heavy thunderstorm made a *vigneron* acutely aware of his precarious financial plight and 'he saw the bailiff at his heels whenever a hailstorm threatened'.⁹

Judith Devlin has emphasized that popular religion in France was characterized for centuries as much by practicality and functionalism as by spirituality. Many expressions of devotion – such as pilgrimages, blessing ceremonies and offerings to the Virgin Mary and to saints – were believed to provide protection against threats to person or property. So strong were such beliefs that attempts were sometimes made to punish saints who were deemed to have ignored the requests made to them. For example, when the harvest was bad, peasants of Quercy in south-western France whipped saints' statues for having allowed hail and frost to ruin the fruits of their labour, and the peasants of Agonges in the Central Massif, having begged the Virgin Mary in vain to deflect a storm, ordered the sacristan to whip her statue. Belief that God was responsible for storms, that hailstorms were an expression of God's anger, underpinned the ringing of church bells by some villagers to assuage Him. Others rang bells in the belief that doing so frightened the Devil away, thunder and lightning being viewed as the celestial hunt, known in the middle Loire Valley as the *Chasse Macabre*.¹⁰ A prayer had been authorised in the sixteenth century by Pope Urban VIII for use by bishops when consecrating bells: 'Grant O Lord, that the sound of this bell may drive away harmful storms, hail and strong winds, and that the evil spirits that dwell in the air may by Thy Almighty power be struck to the ground'.¹¹

'Bells were supposed to preserve the space of a community from all conceivable threats', Alain Corbin has argued, because 'the formulas used in their benediction justified belief in the preservative virtue of the sacred bronze'. Corbin points out that right up until the middle of the nineteenth century the bronze of bells proclaimed their protective virtues, which were inscribed in Latin on the old ones and engraved upon the new. Their protective function thus had a theological justification. Furthermore, some thought that demons dwelling in the clouds were responsible for storms and were terrified by the sound of bells. Thus ringing bells could drive away thunder, lightning and hailstorms. Bells also had the power to summon protective angels. There is evidence from throughout France in the eighteenth and nineteenth centuries that bells were rung to ward off thunderstorms. In one commune in the Sologne, a *pays* with many ponds and small lakes to the south of the middle Loire, church bells were rung three

⁸ E. Zola, *La Terre* (1887). I have used the following editions: *La Terre* (1965), pp. 109–13 and 264; and *The Earth* (1980), pp. 120–24 and 272.

⁹ L. Fabre, *Le Tarramagnou* (1925), p. 61.

¹⁰ J. Devlin, *The superstitious mind: French peasants*

and the supernatural in the nineteenth century (1987), pp. 1–42.

¹¹ B. C. V. Oddie, 'The hail cannon: an early attempt at weather control', *Weather* 20 (1965), pp. 154–6.

times a day and sometimes hourly to ward off thunderstorms. Parts of the Beauce plateau, to the north of the Loire, were devastated on 17 May 1703 by massive hailstones: the villagers of Illiers were reported to have rung its bells so vigorously that the thunderstorm split into two above the parish, each part following its own path, so that this parish alone, in the midst of 30 others that did not have such good bells (or perhaps such good bell-ringers), suffered virtually no damage to its crops.¹²

Gradually, opposition developed to the ringing of bells as a way of protecting crops from storm damage. With the Enlightenment, scientific explanations came to challenge beliefs embedded in popular religion. Claims were made that bell-ringing itself was potentially dangerous, attracting lightning strikes to bell towers and initiating avalanches of snow in mountainous areas. Some bishops and priests came to oppose the practice in part because they wished to distance themselves from popular beliefs. Also, bell-ringing to ward off storms could be confused with their being rung to alert local populations to a fire or even war. At the end of the eighteenth century and throughout the nineteenth, the ringing of bells during thunderstorms – the *carillon de tonnerre* – was banned by ecclesiastical and civil authorities. Notwithstanding this prohibition, popular belief in the efficacy of bell-ringing continued in many localities, sometimes even encouraged by those priests who viewed ringing as a form of prayer and as one form of resistance to creeping, modern, rationalism. An ecclesiastical survey of the *département* of Gers, in south-western France, in 1840, found that the *carillon de tonnerre* was still being practised in all but 14 of its 500 parishes.¹³ An Episcopal survey conducted in 1850 by Mgr Dupanloup in his Orléans diocese, in and around the middle Loire Valley, showed that the practice of ringing bells during thunderstorms was still widespread and that some parish priests lent their support by reading the story of the Passion while the bells were ringing.¹⁴ During the nineteenth century many mayors hesitated to enforce official injunctions against bell-ringing, fearful that their electors would turn against them as readily as parishioners turned against priests who tried to prevent the superstitious practice. Even in the early twentieth century there is an instance from Gascony in which a commune's council, in order to retaliate against the regular bell-ringer who had refused to ring the church bells on 14 July (Bastille Day), appointed another man specifically charged with ringing 'in case of danger from hail'. Weber has argued that 'the ringing of bells brought comfort to those who heard them, allayed anxiety, made them feel less helpless. They gave people something to do (or to think they were doing) when there was nothing they could do'.¹⁵

Bell-ringing might have provided a warning to farmers to protect their crops from an arriving storm but there were few defensive measures they could take apart from hastily removing harvested crops into safe storage. Philip Hamerton (1834–94), an English artist and writer who lived in Burgundy with his French wife for half of his lifetime, observed that faith was mingled with scepticism in the mind of the nineteenth-century peasant who followed a traditional practice to limit hail damage:

¹² A. Corbin, *Village bells: sound and meaning in the nineteenth-century French countryside* (1999), pp. 102–9.

¹³ Weber, *Peasants*, p. 28.

¹⁴ C. Marcilhacy, *Le Diocèse d'Orléans au milieu*

du XIXe siècle: les hommes et leurs mentalités (1964), pp. 264 and 390.

¹⁵ Weber, *Peasants*, p. 28.

When the rustic sticks a blessed hazel twig in his field to preserve it from hail, he cannot feel that it is a sure preventive, because he has often seen fields lashed with hail notwithstanding hazel twigs and benedictions. But then, on the other hand, his fields have often escaped when the blessed hazel was set up in them, and at these times it is just possible that the blessed branch may have been *pour quelque chose*. At any rate, the precaution, such as it is, is one that costs very little.¹⁶

But there was something more that peasants could do and increasingly did do: insure against crop damage by hail. While bell-ringing as risk management persisted in some localities, it coexisted alongside the development of its 'modern', rational and secular, alternative: formal, commercial, insurance. Transforming peasant *mentalités* was both a gradual and a complex process, not necessarily involving the replacement of one modality of thinking with another, but instead the coexistence and commingling of different cultural horizons.

I will now turn to the question of hail insurance in the *département* of Loir-et-Cher which has Blois, located on the Loire between Orléans and Tours, as its administrative centre.¹⁷ An analysis of 6,000 storms in France between 1868 and 1928 showed that Loir-et-Cher was an average *département* in terms of storm frequency, experiencing three to five storms annually.¹⁸ Loir-et-Cher was, notably, one of only 14 out of 87 *départements* in each of which the cost of hail damage to crops amounted to more than a million fr. in 1887 and again in 1888.¹⁹ The first, recently produced map of hail-falls in France today shows the zone of greatest risk to stretch from the south-west to the east-central regions, passing through the Massif Central and extending to the Alps. Loir-et-Cher lies on the northern edge of that zone. Intriguingly, that map is based on insurance data.²⁰

That hailstorms could do considerable damage to growing crops is made clear by the official statistics collected about them.²¹ For example, in May 1907, hailstorms broke out over communes in the western-central district of the Loir-et-Cher: most damage was done at Monteaux, where all properties were affected and losses amounted to 450,000 fr., but it was also considerable at Chissay-en-Touraine (300 owners affected; losses of 280,000 fr.) and Mesland (85; 30,000 fr.). Storms at nearby Veuves, Epiais and Pray affected a further 68 owners, who sustained losses of 17,900 fr. Other storms later in the year were more scattered. In June and July storms in the Grande Sologne at Dhuizon, Mur-de-Sologne and Neung-sur-Beuvron did 3000 fr. of damage to 17 properties, but that pales beside the damage done in the Cher valley by a storm in June at Saint-Georges-sur-Cher where all of the properties were affected and the combined losses

¹⁶ P. G. Hamerton, *Round my house: notes on rural life in France in peace and war* (1876), pp. 262–3.

¹⁷ For maps of the location of Loir-et-Cher within France and of the *département's* physical and administrative geography, see A. R. H. Baker, 'The infancy of France's first agricultural syndicate: the Syndicat des Agriculteurs de Loir-et-Cher, 1881–1914', *AgHR* 34 (1986), p. 47 and id., *Fraternity among the French peasantry: sociability and voluntary associations in the Loire Valley, 1815–1914* (1999), pp. 55–8 and 60.

¹⁸ J. Regnault de Beaucaron, *L'assurance contre la grêle en France et à l'étranger* (1937), p. 54 citing

M. Piron, *Les orages à grêle en France* (1931).

¹⁹ *Statistique Générale de la France: Annuaire Statistique*, 10 (1890), pp. 334–7; 11 (1891), pp. 338–41. The other 13 *départements*, all further south than Loir-et-Cher, were: Aude, Dordogne, Isère, Jura, Loire, Lot, Lot-et-Garonne, Lozère, Pyrénées (Hautes), Rhône, Saône-et-Loire, Tarn and Savoie.

²⁰ F. Vinet, 'Climatology of hail in France', *Atmospheric Research* 56 (2001), pp. 309–23.

²¹ Throughout this paper, values in current francs are normally rounded to the nearest one thousand.

amounted to 800,000 fr. The damage to individual properties in 1907 was very variable, from less than 200 fr. to almost 1,000 fr.²² Study of storm damage to crops in Loir-et-Cher 1868–1928 revealed significant geographical variations at three scales: in the northern *arrondissement* of Vendôme the cost of storm damage was almost twice that in the southern *arrondissement* of Romorantin; in the central *arrondissement* of Blois, damage in the *canton* of Herbault (on the plateau between the Loire valley and the river Loir) was almost ten times greater than that in the *canton* of Saint-Aignan (on the northern side of the river Cher); and within the single *canton* of Ouzouer-le-Marché (on the Beauce plateau) storm damage in the *commune* of La Bosse was 30 times that in Moisy, less than 5 km away.²³ Hailstorms could be devastating but they were localized and the risk of damage to an individual's property was statistically not very high.

II

The idea of agricultural insurance was being actively considered in Loir-et-Cher during the opening decades of the nineteenth century.²⁴ A circular of 24 January 1810 from the Ministry of the Interior in Paris to the prefect of the *département* drew attention to the view of the national *Conseil d'État* about the developing role of *compagnies d'assurance mutuelle* (mutual insurance companies) in countering the damage done to crops by hailstorms and to livestock by epidemics. The usefulness of such societies had come to be appreciated in several French *départements* and the government saw them as contributing to agricultural prosperity: the concern of the *Conseil d'État* was that the establishment of such associations should be properly controlled by the authorities. The prefect wrote on 20 March 1810 to the president of the Society of Agriculture of Loir-et-Cher, inviting the Society to consider the potential of crop and livestock insurance societies, but he had also to send a reminder on 27 November before the Society replied. On 12 December the secretary of the Society responded, saying that the Society's committee had in fact considered the matter in 1807 and had then told the prefect that establishing such societies in Loir-et-Cher would pose some difficulties: firstly, because hail was not as great a problem in the department as in some other regions of France where insurance against hail damage was then being practised; secondly, because there was the dual difficulty of having to assess both the value of the property being insured and of the damage done. The secretary concluded by saying that the Society was preoccupied with the problem of how to combat damage to vines inflicted by *vrebec*, an insect causing leaf-curl.²⁵

The Society's negative response highlights both the range of natural hazards faced by the farming community in the early-nineteenth century and the fact that the Society – a robust promoter of agricultural innovation and denigrator of routine – was not always immediately receptive to new ideas and practices which in due course were to prove to be of considerable benefit to the farming community. The episode also demonstrates how agricultural practices

²² Archives Départementales [hereafter AD] Loir-et-Cher (Blois), Série 6M 1087.

²³ Regnault de Beaucaron, *L'assurance*, pp. 57–8.

²⁴ This section is based principally on unpublished and as yet uncatalogued documents in Série X of the

Archives Départementales de Loir-et-Cher, Blois. The sources used are to be found in the *liasses* titled *Sociétés d'assurances*.

²⁵ AD Loir-et-Cher, Série M 267 cote 12.

in Loir-et-Cher were potentially open to influences from well beyond it even in the early nineteenth century. The idea of formal insurance came from outside, from regional (and even possibly national) government officials. Putting it effectively into practice was also, in many cases, to involve institutions based outside the department. A list compiled by the prefect for the Ministry of the Interior in October 1858 indicates that there were then 25 insurance companies or societies operating in Loir-et-Cher, with only one of them (*La Mutuelle de Loir-et-Cher*) based in the department itself at Blois; two were based in Le Mans, one each of Dijon and Lille, and the rest (20) in Paris. Eleven of them insured both moveable and fixed property (*meubles et immeubles*) against fire; six insured against hail damage; five provided life as well as property insurance; one offered life, property and hail damage insurance; one provided insurance just for moveable property, one for boats and the merchandise they contained; and one covered the drawing of an 'unlucky' number in the lottery for the selection of military conscripts.²⁶ A similar list compiled fifty years later, for December 1908, records more than 120 insurance companies and societies operating in the department but based outside it, predominantly (more than three-quarters) in Paris but also in some of France's major provincial cities like Bordeaux, Lyon and Toulouse, as well as in substantial towns closer to Blois, like Orléans, Chartres, Dreux, Le Mans and Tours. Thirty-three provided cover for personal accidents (at work or on the road), 28 provided fire insurance, 26 life insurance, 25 hail damage insurance, and 9 livestock insurance.²⁷

In 1823 there was established in Paris a *Société d'assurance mutuelle contre la grêle* that was authorized to operate in 11 departments, including Loir-et-Cher. From that year the Society had agents in the three main towns of the *département*, Blois, Romorantin and Vendôme. The members they recruited were obliged to pay an annual insurance premium of between half and one per cent of the value of the insured crops, and it was the role of the agents to assess claims by visiting sites to inspect the damage allegedly done to growing crops during a hailstorm. This Society – which came to be called *La Cérès* after the ancient Roman goddess of agriculture – was the first such successful insurance society in France and continued to operate throughout the nineteenth century in Loir-et-Cher, despite scepticism expressed by the prefect in its early days. On 20 December 1833, in a letter to the Minister of Commerce, the prefect argued that frost was a greater general hazard (especially to vines) than localized hail and that, as most farms (and especially small farms) were fragmented, with parcels of land scattered in different locations, the risk of damage to the growing crops of any one farmer was reduced. He argued that within Loir-et-Cher such an insurance society was only likely to attract members in the *pays* of *grande culture*, like the Beauce and the Sologne, but even in such localities large properties were being increasingly subdivided among a great number of farmers:

who always prefer to run the risk of a hailstorm, which cannot do damage at the same moment to all of the parcels of land which they own because they are scattered here and there, rather than to pay their contribution, even though it might be minimally small,

²⁶ AD Loir-et-Cher, Série X, *Sociétés d'assurances diverses*. Insurance companies often operated with fixed premiums, so that it was the insurer who bore the risk; in mutual societies, risk was shared by their

members who were both the insured and the insurer, operating with variable premiums.

²⁷ AD Loir-et-Cher, Série X, *Sociétés d'assurances diverses: statistiques, correspondance, 1902–1914*.

for damages sustained by others; such is the attitude of those rural dwellers now owning two-thirds of the lands of the department.

Nonetheless, by 1838 there were in Loir-et-Cher some 620 members of *La Cérès* insuring crops valued in total at 3,776,000 fr. The Society, with its headquarters in Paris, had 7,164 members in 16 *départements* in northern France.

By the 1830s there was also operating in the department a second such society, the *Société royale d'assurances mutuelles contre la grêle*, known as *L'Étoile*, founded in Paris in 1834. Initially authorized to operate in 14 departments (mainly in the Paris Basin), that number was increased to 20 in 1837 when it also came to include Loir-et-Cher. It seems that the local authority's earlier reticence about such insurance had by then been overcome, because on 13 January 1837 the prefect informed the Minister of Commerce and Public Works that extending that Society's operations into Loir-et-Cher would be beneficial and serve the department's agricultural interests. By June 1838 crops in Loir-et-Cher were insured with the Society to the value of 351,000 fr.; by the end of 1852 the figure had increased prodigiously to 6,165,000 fr (of which 72 per cent was located in the central *arrondissement* of Blois, 20 per cent in that of Vendôme, and 8 per cent in Romorantin). In July 1839 the agent for *L'Etoile* in Loir-et-Cher reported that there were in the *département* 29 people insured with the company against hail damage to their crops in ten communes close to Blois. The area insured by each farmer was generally in excess of 10 *arpents* and in some instances amounted to as much as 100 *arpents*, while the value of the crops insured by each farmer was estimated as being between 500 fr and 14,000 fr.²⁸ Almost half of the farm holdings in the *département* in the 1830s were of less than 12 *arpents* and hail insurance was mainly being taken up by farmers with larger properties.²⁹

L'Etoile provided insurance against hail damage to growing crops but not to those that had been harvested. It shared the costs of hail damage suffered by any of its members among all of its members, charging an annually variable premium in proportion to the value of crops each member had insured, although no member was required to pay more than 1.25 per cent of the value of his 'first category' insured crops, such as meadow, cereals, sugar beet, potatoes, peas and beans, nor more than 2.5 per cent of the value of his 'second category' crops, such as rape, hemp, hops and herbs. (Gradually, this basic system was refined into four categories according to a crop's vulnerability to hail damage, with vines and hops being the most vulnerable and so attracting the highest premiums.) The premium to be paid each year was changed to reflect the actual cost of hail damage in a given year. Each year each member also paid in advance a sum equivalent to 0.05 per cent of his insured crops (i.e. five centimes per one hundred francs), with interest on the capital fund raised in this way being used, firstly, to pay out indemnities during the year to members whose limited resources meant that they would be in difficulties if they had to wait until the end of the year before being recompensed and, second, to build up a reserve fund which could be called upon in exceptional years when the overall cost of the damage amounted to more than the sum which could be raised by the standard procedure. Members also each paid annually 20 centimes per hundred francs of crops insured to meet the administrative costs of the Society.

²⁸ The *arpent* is an old French measure of area approximately equal to one acre.

²⁹ G. Dupeux, *Aspects de l'histoire sociale et politique du Loir-et-Cher, 1848-1914* (1962), pp. 98-9.

Members had to describe the exact location and provide their own estimated values of the crops they wished to insure. Reports of hail damage to crops and claims for indemnities had to be submitted, within ten days of a damaging storm, to the Society's agent in the member's own *canton*. It had to specify the day and duration of the hailstorm, and the exact size and locations of the areas affected by hailstones. Within ten days of a claim being submitted, the cost of the damage had to be assessed by two people, one appointed by the Society (it had an agent in each *canton* in which it operated) and one by the afflicted member (who was not permitted to nominate a relation or a close friend). If those two assessors were unable to agree, they had themselves to appoint a third, whose decision – which had to lie between the two figures already proposed – would be final. The costs of undertaking such an assessment were shared equally between the Society and the afflicted member, unless the final judgment was that no indemnity was justified, in which case all of the costs were borne by the member. If the damage to a crop had been inflicted early in its growing season and it was deemed possible that the crop might recover, then a second calculation of the cost of the damage would be undertaken later in the year. The aim of the Society was to compensate its members for hail damage to their growing crops and to do so as fully as possible by raising an annually variable premium set at an appropriate rate within agreed limits stated in the Society's statutes. The localized character of hailstorms and the wide geographical spread of the insured parcels of the Society's members, it was thought, made this a reasonable objective.³⁰

Clearly, the administration of such a society required considerable sophistication. During the 1840s at least four other societies insuring crops against hail damage came to operate in Loir-et-Cher, although it is difficult to assess their impact. *La Saumuroise* began its activities in four departments (Maine-et-Loire, Loir-et-Cher, Vienne and Deux-Sèvres) in 1838, although it was not formally authorized until September 1840. On 7 August 1838 the sub-prefect at Vendôme suggested to the prefect of Loir-et-Cher that the Society's headquarters at Saumur, about 100 km from Blois down the Loire valley were too distant from the department for people living in Loir-et-Cher to attend its general meetings or to participate in running the Society, but he nonetheless recognized the considerable utility of such societies. The prefect, on 18 October 1839, declined to express to the Minister of Agriculture an opinion on the Society's draft statutes on the grounds that only five of its members came from Loir-et-Cher. The other societies working in Loir-et-Cher in the 1840s were *L'Union Générale*, authorized in June 1841 at Limoges; *L'Arc-en-Ciel*, authorized at Mulhouse in 1845; and *La Providence Agricole*, authorized in Paris in 1846.³¹

III

Arranging for formal insurance of a variety of kinds was to become increasingly common during the course of the nineteenth century. But a different form of risk management not involving monetary compensation – hail suppression – also came to be considered. On 1 June 1913 there was founded in a hamlet to the west of Blois a *Syndicat Grêlifuge des Grouéts* whose

³⁰ De Beaucaron, *L'assurance*, pp. 52 and 257–76; AD Loir-et-Cher, Série X, Sociétés d'assurances.

³¹ AD Loir-et-Cher, Série X, Sociétés d'assurances.

aim was to protect the vines of its 60 members against damage by hail. It would do so by arranging for the use of anti-hail rockets (*fusés grêlifuges*) or of any other system which might come to be recognized as being more effective. Membership was not restricted to residents of the hamlet but open to all agriculturalists. Theoretically, this enabled the risk to be spread but in practice rockets could only be used over a limited firing field. Those joining the syndicate paid 8 fr. per hectare of vines that they had within the designated field of fire, although the committee of twelve that ran the syndicate could increase or decrease the subscription to meet different circumstances. The eight ordinary members of the committee (and so not the Society's President, Vice-President, Treasurer or Secretary) were responsible for preparing the rockets and determining the number of firing stations to be employed, to ensure that the munitions were not wasted. The syndicate explicitly disallowed use of the rockets for any purpose other than combating storms. According to the prefect of Loir-et-Cher, when this syndicate ceased functioning (some time before 1921), it had 71 members (seven of whom were women) who were no longer convinced that it provided effective protection for their vines.³²

That experience was repeated elsewhere in France. For example, by 1907 in the Beaujolais wine producing *département* of Rhône – the *département* of France most affected by hailstorms – there were 37 local associations using 430 rocket-firing canons (*canons paragrêles*) to protect some 12,000 hectares of vines but with variable and usually poor results, so that the *vignerons* turned increasingly to the greater reliability provided by insurance societies.³³

The opening decade of the twentieth century saw a significant flowering of interest in a number of European countries in the use of cannon to provide protection against hail (see Figure 1). The technique was based principally on belief in one of two hypotheses: that smoke particles would serve as additional condensation nuclei, leading to the formation of more water drops and preventing the stage of super-saturation and cooling that produces hailstones; or that pre-storm firing produced atmospheric shock waves that prevented or diminished hailstone formation. The technique had been developed in Austria in the late 1890s and was then adopted in Italy, Germany, Hungary and Spain as well as France. International conferences on hail suppression were held in Italy in 1899 and 1900, at Lyon, France, in 1901, and in Austria in 1902. The results obtained by cannon firing were reported as being very mixed. Several firing stations were set up in France during 1900: they included 50 cannon at Denicé (Saône-et-Loire), 30 at Saint-Gengoux and Burnand (Saône-et-Loire), 15 at Boën (Loire), and 8 each at Liergues-près-Villefrance and Saint-Emilion (Gironde). The station at Denicé, a product of the collaboration of a number of agricultural syndicates and societies and funded by both regional and national government, was to all intents and purposes an official test site for the method. The results were judged to be perhaps encouraging but certainly inconclusive.³⁴ At first, enthusiasm for the use of cannon blamed failures to suppress hail on their having been improperly fired, with cannon being judged to have been wrongly located, fired only feebly or with too much delay. But as failures multiplied, so did doubts about the efficacy of the method. A report by Professor J. R. Plumadon, meteorologist of the Observatory of Puy-de-Dôme in the Massif Central of

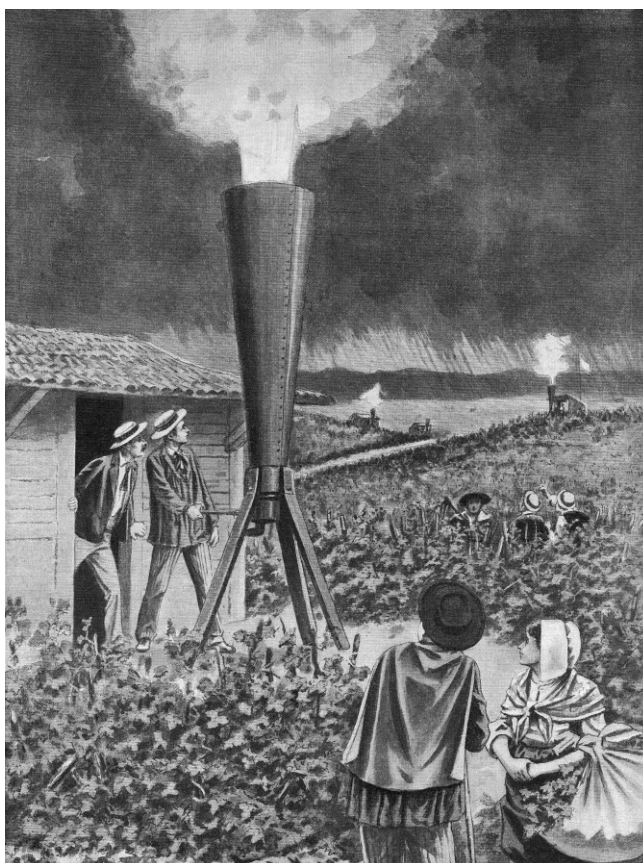
³² AD Loir-et-Cher, Série 10M 55, 57 and 59.

³³ G. Garrier, *Paysans du Beaujolais et du Lyonnais, 1800–1970* (1973), pp. 31–2.

³⁴ F. Houdaille, *Les orages à grêle et le tir des canons* (1901), pp. 31–3.

FIGURE 1. Firing hail-prevention cannon in vineyards: the 3 m-high cannon, described as 'huge champagne flutes', were placed 500 m apart, 44 of them being needed to cover an area of 25 ha. Operational costs per annum were estimated at 4 fr. per hectare.

Source: *Supplément illustré du Petit Journal* 555 (7 July 1901), p. 216.



France, to an international conference in 1901, examined the theoretical and practical evidence for the diminution of hail as a consequence of firing cannon into storm clouds, and concluded that it was far from convincing. Enthusiasm for using cannon waned almost as rapidly as it had waxed, and had virtually disappeared by 1914.³⁵ The failure of the cannon system to stop *all* hail led quickly to its demise – and much more rapidly than the failure of bell-ringing and prayer to stop all hail had led to their abandonment.

IV

Adjustments to the hail hazard by French peasants could theoretically have taken a variety of forms: suppressing the hail, taking measures in the field to modify the potential damage, or making provision financially to bear an actual loss.³⁶ In practice, only the last of these was to prove to be effective in France before 1914. To some extent, the predominance of

³⁵ J. R. Plumadon, 'General report on hail shooting presented to the Congress at Lyons', *Monthly Weather Rev.* 30 (1902/03), pp. 35–8; Oddie, 'Hail cannon' p. 156; S. A. Changnon and J. L. Ivens, 'History repeated: the forgotten hail cannons of Europe', *Bull. American*

Meteorological Society 62 (1981), pp. 368–75.

³⁶ A. L. Rydant, 'Adjustments to natural hazards: factors affecting the adoption of crop-hail insurance', *Professional Geographer* 31 (1979), pp. 312–20.

non-contiguous farm holdings was a form of risk management: the scattering of the parcels farmed by an individual peasant throughout the territory of a commune and even into neighbouring communes was one means by which, given the localized character of hailstorms and their unpredictable paths, the potential risk of damage to crops could be reduced. This was, of course, just one of a number of reasons rather than the principal reason for non-contiguous farm holdings in France. A second adjustment to the hail hazard was the attempt to suppress the hail itself or at least to deflect it to another locality. Both the ringing of church bells and the firing of cannon and rockets into storm clouds came into this category but neither proved to be very successful. No doubt many peasants fatalistically accepted that they would from time to time have to bear the cost of hail damage to their crops from such reserves of cash as they had personally or could obtain from their families, friends, notaries, banks or charities. Others gradually came to see formal, commercial, insurance as the most appropriate way of managing this risk.

During the second half of the nineteenth century, religious practice in Loir-et-Cher fell by half but literacy levels doubled. Faith-based teachings of the Church were increasingly challenged by the science-based schooling provided by the state.³⁷ The growing secularization of society was reflected in the burgeoning of formal insurance as the best way of managing hazards both natural and cultural. As noted above, during the nineteenth century the number of insurance companies operating in the *département* increased from 25 in 1858 to 121 by 1910. Only a few of these insurance companies had their headquarters in Loir-et-Cher, at Blois and Mer; most of them were based in Paris or large provincial centres like Orléans, Bourges, Chartres and Le Mans.

But in addition to these mainly 'external' companies seeking business in Loir-et-Cher, there arose internally within the *département* a wide range of more local associations whose underpinnings lay in risk management. Some 600 work-related, 'instrumental' voluntary associations have been identified in the *département* between 1815 and 1914 involving large sections of its farming community.³⁸ Livestock insurance societies alone numbered more than 160 by 1912 and alongside them were mutual aid societies, volunteer fire brigades, anti-phylloxera syndicates and agricultural associations. These voluntary societies emerged in large numbers to combat a wide range of risks: livestock epidemics, illness and accidents preventing people from working, damage and destruction of property by fire, devastation of vineyards by phylloxera, and declining soil fertility and lower crop yields. Such associations had multiple purposes: they had both manifest and latent agendas, they promoted both social cohesion and social conflict, they were battle grounds for the minds of local populations fought over by representatives of the Church and of the state, and they were seedbeds for the growth of local democracy. But, fundamentally, they were 'modern' responses to risk replacing 'traditional' ways that were found increasingly wanting. Ringing church bells and firing rockets into storm clouds gave way

³⁷ Baker, *Fraternity among the French peasantry*, pp. 71–9 and 88–93.

³⁸ *Ibid.*, pp. 284–301. 'Instrumental' societies differ from 'expressive' societies: the latter exist in order to express or satisfy specific interests which members

have in relation to themselves, such as sports clubs and musical societies, while the former focus their activities upon the wider society in order to bring about specific material benefits to their members, such as agricultural cooperatives and insurance societies.

to the greater reliability of formal insurance. For example, *L'Etoile* – founded in 1834 – today provides hail protection cover for farmers throughout France.³⁹

V

This paper has focused on the middle Loire Valley. Loir-et-Cher was on the northern margin of the region of France that suffers most from hail. It serves here as a window upon the landscape of hail insurance in particular and of agricultural insurance more generally in France before 1914. By the end of the nineteenth century, farmers in France were turning in increasing numbers to insurance societies to protect their crops, livestock, and buildings from a wide range of risks. Figures provided by the Ministry of Agriculture for agricultural insurance societies should not be regarded as being wholly accurate, given their compilation from information submitted by prefects of almost 100 *départements* and the fact that the prefects were reliant on data submitted by almost 40,000 mayors of communes. Some small societies no doubt went unrecorded. Nonetheless, the overall picture provided by official statistics is clear.

The Ministry of Agriculture reported that there were 1,484 agricultural insurance societies of all kinds in 1898 but 11,880 by 1910. Their very rapid growth was encouraged by the Ministry which both made it easier administratively for such societies to be established and provided them with subsidies totalling between 500,000 fr. and 1,200,000 fr. annually. During the eight years from 1898 to 1905, the state provided subsidies to 8,523 agricultural insurance societies (with some receiving more than one grant): four grants were made to societies covering personal accidents, 62 to those providing insurance against hail damage, 245 to those providing fire insurance, and 8212 to those insuring livestock.⁴⁰

Recorded livestock insurance societies numbered 1917 in 1899 and 9511 in 1910. At this latter date, they had 441,162 members insuring animals valued at 536,403,000 fr. There were also 58 livestock reinsurance societies with a total of 3,055 members insuring animals valued at 153,901,000 fr. Insurance of fire risks was more embryonic but still significant. According to the Ministry's statistics, in 1910 there were 2252 agricultural fire insurance societies and 27 fire reinsurance societies, with memberships of 91,716 and 2194 respectively, insuring agricultural properties with capital values of 1,067,136,000 fr. and 313,468,000 fr. respectively. Recorded hail insurance societies numbered 25 in 1910, with a total of 44,677 members insuring crops valued at 28,160,000 fr. There were no hail reinsurance societies.⁴¹

The idea of insuring crops against hail damage had been first mooted in France at Toulouse by M. Barrau in 1799 when he established a mutual society that operated for ten years until it was suspended by the Government because its statutes were judged not to be in good order. As part of the general growth of insurance provision during the nineteenth century, a number of hail insurance societies with a regional or wider geographical reach were founded from the 1820s onwards. Most were mutual societies (like *La Cérès*, 1823 and *L'Etoile*, 1834) operated with variable premiums, a handful (like *L'Abeille*, 1856 and *La Rurale*, 1895) were companies based

³⁹ www.etoile-assurance.fr [accessed 10 Jan. 2011].

⁴⁰ *Journal Officiel de la République Française* (1 Apr. 1906).

⁴¹ *Journal Officiel* (1908) Annexe 2030; (1909) Annexe 2807 and Annexe 2959; (1911) Annexe 1254; (1912) pp. 930–31.

on fixed premiums. Quite a few had short life spans, having not been established on secure financial footings.⁴² Samuel Brown, one of the founders of the English insurance journal, *Assurance Magazine*, reporting in 1851 on life and property insurance on the Continent, noted the creation of 28 hail insurance companies in France between 1809 and 1846. He argued that the growth of hail insurance was being checked by the difficulty of spreading the risk over a sufficiently wide geographical area and so by the need for high premiums to meet the losses in the worst affected localities. Weak financial standing meant that hail insurance companies in France during the 1840s paid indemnities of between only 12 per cent and 60 per cent, so that many farmers withdrew from the companies, preferring to bear the risks themselves.⁴³ In the 1870s, Cornelius Walford reported that hail insurance companies in France had been paying indemnities of between 12 per cent and 100 per cent and that many of them were not able to conduct their business successfully.⁴⁴ But by 1890, according to Jacques Regnault de Beaucaron, deputy director of *L'Etoile*, these regional (and in some cases national) companies and societies collected premiums that totalled just over 8,000,000 fr., insuring crops valued at just under 603,000,000 fr.; by 1913 premiums amounted to just over 14,000,000 fr., insuring crops valued at just over 1,000,000,000 fr.⁴⁵ These companies and societies clearly outstripped the much slower and less significant growth of local hail insurance societies. They spread the risk over much wider geographical areas.

Local hail insurance societies based on a single commune, or on a few contiguous communes, or on a canton embracing ten or so communes, were not numerous. During the 17 years from 1898 to 1914, the state gave 18 grants to such societies being newly created and 102 grants to societies already in existence (with some such societies receiving more than one grant). During that period, subsidies amounted in total to 238,200 fr. The number of societies grew slowly, from 12 in 1898 to 28 in 1912 (with no increase on that number during the following two years). According to Regnault de Beaucaron, their overall membership rose from 16,812 in 1898 to reach a peak of 47,737 in 1909, from which it declined to 37,940 by 1914. The crop value insured rose from 8,499,000 fr. in 1898 to a peak of 30,524,000 fr. in 1913, falling to 29,536,000 fr. in 1914.⁴⁶

There were so few local hail insurance societies, the Minister of Agriculture argued in 1906, because a hailstorm track could devastate an entire locality or region within a few hours, so that it was not possible for a society whose members came from one canton or even from a whole department to indemnify appropriately all of the victims. The risk, he argued, should be spread over a wider area, a larger territory, if not the whole country. He even envisaged local hail insurance societies being reinsured by regional societies and they perhaps in turn

⁴² Regnault de Beaucaron, *L'assurance*, pp. 79–84. He lists the following three hail insurance *Compagnies par actions* with date of establishment: L'Abeille (1856), La Confiance (1895), La Rurale (1895), and the following twelve hail insurance *Sociétés mutuelles*: La Cérés (1823), La Société de Toulouse (1826), La Mutuelle de Seine-et-Marne (1829), L'Etoile (1834), La Beauceronne Vexinoise (1849), La Mutuelle de Seine-et-Oise (1854), La Garantie Agricole (1854), La Régionale du Nord (1869), La Gironde (1870), La Ferme (1887), La Ruche (1896), and La Mutuelle du Poitou (1908).

⁴³ S. Brown, 'Sketch of the recent progress of the assurance of life and property on the Continent', *Assurance Magazine* 1 (1851), pp. 293–307 and 2 (1851), pp. 16–32, repr. in D. T. Jenkins and Y. Yoneyama (eds), *The history of insurance* (8 vols, 2000), VI, *Life*, pp. 134–66.

⁴⁴ C. Walford, *The insurance cyclopaedia* (6 vols, 1871–80), vol. 4 (1876), pp. 285–8.

⁴⁵ Regnault de Beaucaron, *L'assurance*, pp. 79–84.

⁴⁶ *Ibid.*, pp. 109–13.

TABLE 1. Hail damage and livestock mortalities on farms in France, 1872–87 and 1898–1913

	1872–87	1898–1913
Average annual number of farms affected by:		
Hail damage	235,778	226,024
Livestock mortalities	73,623	40,112
Average losses (in fr.) nationally from:		
Hail damage	86,848,215	91,365,650
Livestock mortalities	32,436,780	11,373,221
Multiple by which average cost of hail damage nationally exceeded that of livestock mortalities:	2.7	8.0

Sources: Calculations for 1872–87 based on data in Regnault de Beaucaron, *L'assurance*, pp. 528–9 and for 1898–1913 on data in *Statistique Générale de la France: Annuaire Statistique*, 20–34 (Paris, 1900–15).

being reinsured by the state.⁴⁷ In 1909, 13 *députés* argued forcefully that there should be a national scheme of agricultural insurance. They argued that local hail insurance societies could not flourish because the risk needed to be spread over a very wide geographical area. Moreover, small farmers hesitated to take out hail protection policies with private insurance companies because they considered premiums to be too expensive and submitting insurance claims too complex. These *députés* also dismissed the alternative – firing cannon into storm clouds – because installing the cannon was difficult, the results were not impressive and this method was not applicable to regions where the value of the crops was low and where the area of cultivation was extensive.⁴⁸ Views thus expressed by the Minister of Agriculture and by some *députés* were significantly confirmed in 1913 by Monsieur V. Vermorel, Senator for the Rhône *département*, long-serving President of the agricultural and viticultural committee of Beaujolais and Vice-President of the *Commission Météorologie agricole de France*. He argued forcefully for insurance as the best way of managing the hail risk and for regional reinsurance funds, and even a national fund similar to that then in existence for livestock insurance, to guarantee a wide geographical spread of the risk.⁴⁹

For the country as whole, hail inflicted greater financial damage on French farmers and on more of them than did contagious livestock diseases (Table 1). From 1905 to 1913, the cost of hail damage nationally amounted to just over 782 million fr. or about 6.5 per cent of the overall value of agricultural production in that period as calculated by J-C. Toutain. The cost of livestock mortalities was much less, at just over 100 million fr., representing only 0.8 per cent of the calculated overall value of French agricultural production.⁵⁰ Nationally, hail was

⁴⁷ *Journal Officiel* (1 Apr. 1906).

⁴⁸ *Journal Officiel* (1909) Annexe 2807.

⁴⁹ V. Vermorel, *L'assurance contre la grêle* (1913).

⁵⁰ *Annuaire Statistique* 26 (1906), p. 345; 27 (1907), p. 300; 28 (1908), p. 283; 29 (1909), p. 305; 30 (1910), p. 271; 31 (1911), p. 279; 32 (1912), p. 274; 33 (1913), p. 260;

34 (1914–1915), p. 319. J-C. Toutain, *La production agricole de la France de 1810 à 1990: départements et régions*, I, (Paris, 1992), p. 298. For a detailed account of livestock insurance in Loir-et-Cher, see Baker, *Fraternity among the French peasantry*, pp. 106–41.

TABLE 2. Hail damage and livestock mortality costs (fr.) incurred per farm affected
1872–1887 and 1898–13

	<i>Hail damage</i>	<i>Livestock mortalities</i>		<i>Hail damage</i>	<i>Livestock mortalities</i>
1872	310.7	562.4	1898	343.8	257.8
1873	327.7	495.1	1899	368.3	247.4
1874	432.9	609.5	1900	441.4	250.7
1875	359.5	684.4	1901	369.5	251.8
1876	279.4	448.0	1902	415.9	205.7
1877	352.3	435.9	1903	368.6	351.1
1878	337.8	416.2	1904	359.2	312.5
1879	353.4	408.3	1905	403.3	296.2
1880	400.6	425.2	1906	362.5	233.4
1881	361.5	473.6	1907	392.6	314.3
1882	528.5	436.3	1908	447.3	334.3
1883	297.9	422.0	1909	408.7	327.7
1884	277.7	392.6	1910	467.3	368.2
1885	466.2	413.0	1911	477.7	342.3
1886	412.2	358.3	1912	380.1	328.8
1887	343.3	369.4	1913	486.0	259.7
Mean	368.3	440.6	Mean	404.3	283.5

Sources: Calculations for 1872–87 based on data in Regnault de Beaucaron, *L'assurance*, pp. 528–9 and for 1898–1913 on data in *Statistique Générale de la France: Annuaire Statistique*, 20–34 (Paris, 1900–15).

a more costly hazard than livestock mortalities. But for individual farmers the picture is less clear. During the 1870s, the costs of hail damage per farm affected were lower than those from livestock mortalities; during the 1880s they sometimes exceeded them; and from at least the late 1890s they consistently did so through to 1913 (Table 2). Nonetheless, insuring crops against hail damage was adopted much more slowly than livestock insurance.

Hail damage, especially to highly valuable crops like vines, hops and tobacco, was a serious hazard for more farmers than livestock mortality. When hail fell, it could be at great cost to a farmer. But the fact that hailstorms were always unpredictable and often localized led farmers to adopt hail insurance only gradually. The proportion of those whose properties were afflicted by hail, who were also insured with a local society or with a regional or national insurance company or society rose from 3.1 per cent in 1898 to 9.5 per cent in 1913 (the three-years' moving average increased during that period from 4.4 per cent in 1898–1900 to 8.7 per cent in 1911–13). Farmers who were slow to adopt hail insurance turned more readily to livestock insurance. The proportion of those who suffered livestock mortalities *and* who were insured with a local society or with a regional or national insurance company or society rose from 3.4 per cent in 1898 to 20.8 per cent in 1913 (the three-years' moving average increased during that period from

5.8 per cent in 1898–1900 to 23.5 per cent in 1911–13).⁵¹ Compensation by the government in grants from 1872 to 1887 covered only 1.7 per cent of the cost of farmers' losses from livestock mortalities and only 2.3 per cent of their crop losses from hail damage. In relation to both afflictions, there remained a massive proportion of the losses to be met from the farmers' own savings or from insurance indemnities.⁵²

The differential rate of adoption of hail insurance and livestock insurance reflected peasants' attitudes to risk assessment and farm management. Hail damage to specific parcels of land was less predictable, less common and less preventable by good husbandry than was the risk of disease to livestock. Some animals were valued not only for their products but also as vital sources of power on farms. Furthermore, hail insurance was more complex and more costly than livestock insurance. Premiums varied not only according to the vulnerability of the crops being insured but also from year to year to take into account the cost of indemnities being paid. The indemnity pay-out was also variable from year to year, taking into account the scale of the hail damage and the cash reserves of a society or company. Assessing the risk of hail damage and the benefits of insurance was no easy task for the peasant farmer. By the early twentieth century, hail insurance was coming widely to be seen as being expensive and claims for indemnities as being complex and inadequate. Indemnity levels for hail damage, at around 20–40 per cent, were much lower than for livestock mortalities, at around 50–80 per cent. Monsieur Vermorel, in his account of hail insurance, argued that premiums could be as high as 17 per cent while indemnities could be 'derisory'. Nor did hail insurance have the benefit of reinsurance schemes of the kind that underpinned livestock insurance.⁵³ And no doubt some peasants took to any form of insurance hesitantly because it was known that some self-announced 'insurance agents' touring the countryside were fraudsters selling worthless policies.⁵⁴

VI

But by the early twentieth century, for many farmers in France, insurance against environmental hazards was, and for others it was becoming, a new religion. Insurance was an increasingly important tool in the peasants' survival kit. This appears to contrast with the position of farmers across the Channel, although surprisingly little attention has been paid to insurance in farming in Britain either by historians of insurance or by agricultural historians. In the massive and authoritative six volumes of Cornelius Walford's *The Insurance Cyclopaedia* (1871–80), only a dozen pages addressed hail insurance and they were concerned as much with its practice on the continent of Europe as in the British Isles. Walford noted that the business of hail insurance in England started in the 1840s, some twenty years after it had taken off France. Just a few commercial companies were selling hail insurance in the British Isles by the 1870s,

⁵¹ *Annuaire Statistique* 20 (1900), p. 356; 21 (1901), p. 357; 22 (1902), p. 295; 23 (1903), p. 340; 24 (1904), p. 286; 25 (1905), p. 307; 26 (1906), p. 345; 27 (1907), p. 300; 28 (1908), p. 283; 29 (1909), p. 305; 30 (1910), p. 271; 31 (1911), p. 279; 32 (1912), p. 274; 33 (1913), p. 260; 34 (1914–1915), p. 319.

⁵² *Annuaire Statistique* 10 (1890), pp. 528–9.

⁵³ *Journal Officiel* (1908) Annexe 2030; (1909) Annexe 2807; Vermorel, *L'assurance*, pp. 9–10.

⁵⁴ J.-M. Déguignet, *Mémoires d'un paysan bas-breton, 1834–1905* (1998; English trans., 2004), pp. 353–60.

with cover being provided mainly for cereals, the acreage of which was steadily decreasing. He observed that on the continent hail insurance was much more general than in England and that the practice had not penetrated to Wales, Scotland or Ireland.⁵⁵

The history of hail insurance in England has received scant attention. W. A. Dinsdale, in his *History of accident insurance in Great Britain* (1954), merely noted, in just eight of 350 pages, the slow and limited development of hailstorm insurance in England during the nineteenth century (although two of those pages were addressed interestingly to hailstorm glass, rather than crop, insurance).⁵⁶ An authoritative, indeed massive, survey of the agrarian history of England and Wales between 1850 and 1914 published in 2000 made no reference to any form of agricultural insurance. The only references to insurance were related to farmers arranging loans from insurance companies.⁵⁷ And a massive history of insurance published in eight volumes in 2000 says nothing about hail or livestock insurance in England.⁵⁸

There are signs now of a nascent interest by historians in agricultural insurance in England. A recent paper by David R. Stead on risk management in English agriculture c.1750–1850 noted that some commercial companies began to offer insurance policies against hail damage from the 1840s but their take-up ‘appears to have been low’. The same seems to have been the case with the livestock insurance offered by some companies from that time. The cow clubs operating on a mutual basis at the local level seem to have grown in numbers from the second quarter of the nineteenth century but they had only limited success.⁵⁹ The late Stephen Matthews has shown that some tenant farmers in England, especially those with limited (if any) capital reserves, in effect had mortalities among their livestock during epidemics underwritten by landlords displaying a sense of responsibility, not only to their tenants, but also to the landscape of their estates.⁶⁰ In 1912, only 135 co-operative cow insurance societies were known to the Board of Agriculture and Fisheries in all of England and Wales.⁶¹ By contrast, in France in 1899 there were 1,917 livestock insurance societies and André Gueslin has estimated that by 1914 about one in four of its rural communes had such a society.⁶² If insurance against damage to crops by hail and against loss of livestock by accident or epidemics was not a very significant feature of English agriculture during the nineteenth century – as seems to have been the case – then this would constitute an important contrast with French agriculture, with the latter in this regard being surprisingly more innovative. While a recent collection of essays has emphasised parallels between the histories of British and French agriculture, the relative roles of insurance in those two countries in the nineteenth century draws attention to a significant and as yet unexplained divergence.⁶³

⁵⁵ Walford, *Insurance cyclopaedia*, V, pp. 586–97.

⁵⁶ W. A. Dinsdale, *History of accident insurance in Great Britain* (1954), pp. 227–34.

⁵⁷ E. J. T. Collins (ed.), *The agrarian history of England and Wales*, VII, 1850–1914 (2 vols, 2000), I, pp. 753–6.

⁵⁸ Jenkins and Yoneyama (eds), *History of insurance*.

⁵⁹ D. R. Stead, ‘Risk and risk management in English agriculture, c.1750–1850’, *ECHR* 57 (2004), pp. 334–61.

⁶⁰ S. Matthews, ‘Cattle clubs, insurance and plague in the mid-nineteenth century’, *AgHR* 53 (2005),

pp. 192–211 and ‘Underwriting disaster: risk and the management of agricultural crisis in mid-nineteenth century Cheshire’, *AgHR* 58 (2010), pp. 217–35.

⁶¹ J. Wilson, ‘The co-operative insurance of livestock in England and Wales’, *J. Royal Statistical Society* 77 (1914), pp. 145–56.

⁶² A. Gueslin, *L'invention de l'économie social: le XIXe siècle français* (1987), pp. 285–7.

⁶³ J. Broad (ed.), *A common agricultural heritage? Revising French and British rural divergence* (2009).