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## The Quail Epidemic of Numbers 11.31–34

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During their long and arduous journey through the Sinai Peninsula, the Children of Israel faced many public health problems, a number of which were concerned with their food supply. The occurrence of some of these problems is reflected in the levitical regulations which have come down to us in the books of the Pentateuch.<sup>1</sup> Others were described in the narrative portions of these books. One of these latter problems was the epidemic described in Numbers 11.31–34, which was associated with the consumption of the bird whose Hebrew name was *sē'āw*.

All the early versions of the Old Testament from the Septuagint onwards, understood this name to refer to the *quail* and this is the translation given in the English versions. However, there have been other suggestions for the meaning of the word which were reviewed by Houghton<sup>2</sup> and Tristam.<sup>3</sup> These include desert locusts, flying fish, white storks and sand grouse, but both these authors as well as more recent ones are agreed that the quail is the bird intended. In fact, a former superintendent of the London Zoo says 'the quail is one of the few biblical birds which can be identified with certainty'.<sup>4</sup>

The origin of the Hebrew name for the bird is unknown; the Oxford

1 C. G. K. Gillespie, *The Sanitary Code of the Pentateuch* (London: Religious Tract Society, 1894). See also G. J. Wenham, *New International Commentary on the Old Testament: Leviticus* (Grand Rapids: Eerdmans, 1979), 165–181 & 240–246.

2 William Houghton in *A Dictionary of the Bible* edited by William Smith (London: John Murray, 1863), vol. 2, 979, art. 'Quail'.

3 H. B. Tristam, *The Natural History of the Bible* (London: SPCK, 1880), sixth edition, 230.

4 G. S. Cansdale, in *The Lion Handbook to the Bible* edited by David & Pat Alexander (Berkhamstead: Lion, 1973), 189, art. 'Quail'.

Hebrew Lexicon suggests that it is a foreign loan word.<sup>5</sup> Similar names occur in other Semitic languages such as Arabic (*sakwā*), Aramaic, Syriac and Samaritan. It has been derived from a Hebrew verb *šālew* which means 'to become fat' or 'to be lazy or at rest'.<sup>6</sup> If the former meaning is accepted, it would refer to the quail's plump body and fatty flesh, and if the latter, to its heaviness and slowness in flight. However, Driver rejects this derivation because it 'violates the phonetic law governing sibilant mutation'. He suggests that the name like many of the Hebrew names for birds is of onomatopoeic origin, with the 'l' sound which occurs in every form of its name representing the 'very liquid sound' of the quail's call.<sup>7</sup> The original meaning of the English term for the bird (and the very similar French name) is likewise obscure but is probably of Teutonic derivation via Old French.<sup>8</sup> It too may be onomatopoeic in origin.

### The Quail

The quail is the smallest and least sedentary of the game birds. It is closely allied to the partridge and belongs to the same family as the domestic fowl, the pheasant and the peacock, the Family *Phasianidae*. It belongs to the genus *Coturnix* and the species most likely to have been involved in the incidents recorded in Exodus and Numbers is *the Coturnix coturnix* or the common quail. This is the species which is the best known and most widespread of the quails which are noted for their migratory behaviour.<sup>9</sup>

They migrate mostly by night in large flocks composed of discrete groups of twenty or thirty birds. Because of their relatively heavy bodies and short wings they cannot cover great distances at a time and so prefer to fly with the wind rather than against it, unlike most other birds.<sup>10</sup> They winter in African lands and then during the months of March and April they migrate northwards, first to the lands of North Africa

5 Francis Brown, S. R. Driver & C. A. Briggs, *A Hebrew & English Lexicon of the Old Testament* (Oxford: Clarendon Press, 1957), 969, s.v. *šēlāw*. This lexicon is quoted hereafter as BDB.

6 H. B. Tristram, op. cit., 231. Cf. Ludwig Koehler, *Old Testament Lexicon* (Leiden: Brill, 1953), 923, s.v. *šēlāw*.

7 G. R. Driver, 'Birds of the Old Testament, Part II', *Palestine Exploration Quarterly*, vol. 87 (April 1955), 132, n. 10.

8 *The Oxford English Dictionary* (Oxford: Clarendon Press, 1971), compact edition, vol. 2, 2381, s.v. quail.

9 G. S. Cansdale, *Animals of Bible Lands* (Exeter: Paternoster Press, 1970), 167. Cf. H. B. Tristram, *The Survey of Western Palestine: The Fauna and Flora of Palestine* (London: Palestine Exploration Fund, 1885), 124.

10 H. C. Hart, *Natural History of the Bible* (London: Religious Tract Society, 1888), vol. 2, 182.

and Egypt. They then cross the Mediterranean and spread throughout Europe and western Asia, descending to rest on the islands of the Mediterranean which may lie in their path. According to Pliny they even perched on the rigging and decks of ships in such numbers that they made the vessels top-heavy and liable to sink.<sup>11</sup>

On the east they converge on the Red Sea from southern Egypt and Arabia and fly up alongside it until at its bifurcation they enter the peninsula of Sinai. It is here that the route of their migration would cross the path of the Children of Israel as they journeyed from Egypt to Canaan. After crossing the Sinai desert, the quails continue their flight northwards across Israel and Syria until finally they reach Europe and western Asia where they spend the summer in feeding and breeding. In late autumn they return south again in even greater numbers along the same route by which they came north in the spring. These migrations were well-known to the ancients and are described by Aristotle and others.<sup>12</sup>

The quails feed on the seeds of food crops, grasses and weeds, and on caterpillars and snails. The quail and its eggs provide 'the most delicate eating of all game'.<sup>13</sup> It is this property which has been their undoing in modern times for, as Meinertzhagen puts it, 'the quail has suffered cruelly from its own gastronomic excellence',<sup>14</sup> with the result that the quail population has been greatly reduced in the various lands where the birds were formerly found in abundance. It was also because of this desirable property of theirs that quails entered the history of the wilderness wanderings of the Children of Israel as recorded in the Old Testament.

### Israel and the Quail

During their sojourn in Egypt before the Exodus, the Children of Israel would have been very familiar with the quail and its annual migrations. As these birds landed to rest and to feed in Egypt during their migration, they were easily caught by the people in nets and snares, and these methods of capture are illustrated by frescoes on the walls of tombs in Egypt. One of the earliest known of these, dates from the twenty-third century BC in the tomb of Mera at Saqqara, long before the family of Jacob entered Egypt.<sup>15</sup>

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11 Pliny, *Natural History* 10. 33 (Loeb edition vol. 3, 335).

12 Aristotle, *History of Animals*, 8. 597 (Loeb edition, vol. 11, 135).

13 H. B. Tristram, *Natural History of the Bible* (London: SPCK, 1880), sixth edition, 233.

14 Richard Meinertzhagen, *The Birds of Arabia* (Edinburgh: Oliver & Boyd, 1954), 569.

15 Alice Parmelee, *All the Birds of the Bible* (London: Lutterworth Press, 1960), 74. Cf. F. S. Bodenheimer, *Animals and Man in Bible Lands* (Leiden: Brill, 1960), 124.

There are two specific occasions on which quails featured in the history of Israel according to the Old Testament record. These are described in Exodus 16.13 and in Numbers 11.31–34 and are mentioned in Psalms 78.26–30 and 105.39–42.

### *1. In the Wilderness of Sin (Exodus 16)*

On the first occasion, the Israelites were in the Wilderness of Sin between the oasis of Elim and Mount Sinai on the southwestern side of the Sinai Peninsula (v. 1). They had grumbled against Moses and Aaron about the lack of food in the desert compared with the abundance which they had enjoyed in Egypt. They accused Moses and Aaron of taking them out into the desert to starve them to death (vv. 2–3). The result was that God promised Moses he would provide the people with bread and meat (v. 8). When these appeared, the bread was what the people called 'manna' (vv. 14–15, cp. v. 31), and the meat was in the form of quails (v. 13). The manna looked like coriander seeds with the pale yellow colour of gum resin and was made into cakes (Numbers 11.7–8 NRSV). The quails were not described, suggesting that they were already well-known to the people.

Few details are given of the arrival of the quails on this occasion. Their coming is dated to late in the month of April, about six weeks after they had left Egypt (v. 1). This was the season of the northward migration of the quails from Africa to Europe and Asia. They came in the evening and when they landed they covered the area of the camp of the Israelites (v. 13) which suggests that they arrived in large numbers. This coming of the quails is referred to in Psalm 105.40, but this verse adds no significant detail to the record in Exodus.

### *2. In the Wilderness of Paran (Numbers 11)*

The second occasion on which quails entered the record of the history of Israel found the people in the Wilderness of Paran on the north-eastern aspect of the peninsula of Sinai. They had set out for Paran from Mount Sinai almost exactly one year after they had left the Wilderness of Sin (10.11), but they arrived in a situation which was very similar to that which had occurred previously.<sup>16</sup> On that occasion, the

16 The second appearance of quails in the record of the wilderness wanderings of the Israelites led the twelfth-century Jewish exegete Joseph ben Isaac (Bekhor Shor) to speculate that the first mention of quails in Exodus 16.13 referred to the same incident as that described here in Numbers 11.31–32. In this he has been followed by some modern authors. See Jacob Milgrom, *JPS Torah Commentary: Numbers* (Philadelphia: Jewish Publication Society, 1990), 91. However, it is clear from the narrative that the time, place, purpose and result of the second incident are quite different from those of the first one.

people had complained about the lack of food in the desert, but this time they did not complain about the lack of food, only about its monotony (v. 6). They recalled the meat and the fish they had had freely available in Egypt, to say nothing of the fruit and vegetables (v. 5). The complaint began with the non-Israelites amongst them, who are referred to in the narrative (v. 4) as *ēreb*, a word which has been translated as 'riff-raff' (Moffatt) or 'rabble' (NIV).

Moses took their complaint to God who told him to tell the people that they would eat meat on the following day and for a whole month thereafter. In fulfilment of this promise we are told that 'a wind went out from the Lord and drove quail in from the sea' (v. 31). According to Psalm 78.26 this was a south-east wind which means that the sea referred to was the Gulf of Aqaba (or Eilat). However, Noth insists that the sea 'must mean the Mediterranean' presumably on the basis that frequently in the Old Testament, the unqualified term 'the sea' often means the Mediterranean sea.<sup>17</sup> If this is so, then the wind would be a west wind, which is what the NEB and the REB alone among the English versions understand it to have been. From whichever direction it may have come, we are told that the wind brought in the quails to the camp of the Israelites where they were captured as they flew in or as they fell exhausted to the ground.

Any estimate of the number of birds involved depends on the interpretation of the second half of verse thirty-one. There are two such interpretations which may be illustrated by comparing two modern English translations as follows:

A wind went out from the Lord, and it brought quails from the sea and let them fall beside the camp, about a day's journey on this side and a day's journey on the other side all around the camp, about two cubits deep on the ground (NRSV 1989).

There sprang up a wind from the Lord, which drove quails in from the west, and they were flying all round the camp for the distance of a day's journey, three feet above the ground (REB 1989).

Most English versions adopt the former interpretation, namely that the quails formed heaps two cubits (or three feet) high on the ground.<sup>18</sup> The latter interpretation suggests that the mention of the two cubits (or three feet) refers to the height at which the birds flew above the ground. This interpretation is accepted by Jewish

<sup>17</sup> Martin Noth, *Numbers: A Commentary* (London: SCM Press, 1968) 9-90.

<sup>18</sup> G. J. Wenham, *Tyndale Old Testament Commentary: Numbers* (Leicester: Inter-Varsity Press, 1981), 109.

commentators<sup>19</sup> and by the Vulgate, and is used in the NEB and the REB. Whichever interpretation is accepted must be able to account for the massive numbers of birds required to feed six hundred thousand men and their families for a whole month (v. 21).<sup>20</sup>

It is difficult to estimate the area over which the birds fell since we do not know what was regarded as a day's journey at that time, and whether this referred to the distance covered by an individual or by the whole assembly of the Israelites as they journeyed. It has even been suggested that this phrase was an idiom for the distance of 'a stone's throw',<sup>21</sup> but this seems unlikely.

It is not said how the quails were caught and killed. The common custom in Egypt was to catch the birds in nets or snares.<sup>22</sup> Once the birds were captured they were probably killed by wringing their necks or by clubbing. The dead quails were collected by the people over a period of two days and one night. Everyone collected at least ten homers. The homer is the largest measure of volume in the Old Testament and is usually defined as the load which can be carried by a donkey.<sup>23</sup> Ten homers would thus represent a very large number of birds. However, in addition to its specific meaning of a unit of capacity, the Hebrew word *hōmer* also has a non-specific meaning in which it is used for 'a heap' as in Exodus 8.14 (10 in Hebrew text) where it is used to describe the heaps of dead frogs which resulted from the second plague of Egypt.<sup>24</sup> Here in Numbers 11.32, therefore, the text may mean that each person collected ten heaps of quails without describing the exact quantity of birds involved. However, this would still represent a large number of birds.

Once the quails had been collected, they were spread out on the ground to be dried in the sun in order to preserve them for later use as

19 M. Rosenbaum & A. M. Silberman (eds.), *Rashi's Commentary on the Pentateuch: Numbers* (London: Shapiro, Valentine & Co., 1933), 58 & 192. Cf. J. H. Hertz (ed.), *The Pentateuch & the Haftorahs* (London: Soncino Press, 1938), 617.

20 For a discussion of the problem of the large numbers of the population described here and elsewhere in the book of Numbers see T. R. Ashley, *New International Commentary on the Old Testament: Numbers* (Grand Rapids: Eerdmans, 1993), 60–66.

21 Walter Riggans, *Daily Study Bible: Numbers* (Edinburgh: St Andrew Press, 1983), 99.

22 J. G. Wilkinson, *Manners & Customs of the Ancient Egyptians* (London: John Murray, 1837), three-volume edition, vol. 3. 49. For a modern account see C. S. Jarvis, *Yesterday and Today in Sinai* (Edinburgh: William Blackwood, 1931), chap. 149 'Quail Netting for the European Market', 258–264.

23 The *hōmer* is the largest dry measure of capacity mentioned in the Old Testament. The term is related to the Akkadian word for a donkey and is usually understood to mean the load which a donkey was able to carry. See T. R. Ashley, op. cit., 218.

24 BDB, 331, s.v. *hōmer*. 'There is every reason for believing that "the homers" here spoken of do not denote strictly the measure of that name, but simply "a heap": this is the explanation given by Onkelos and the Arabian versions of Saadiah and Erpenius in Num. 11.32' (Houghton, op. cit., 980). Cf. Milgrom, op. cit., 92 & 309 (ref. 82).

food. Commentators commonly suggest that in this the Israelites followed Egyptian practice as described by Herodotus, but this is to misunderstand Herodotus who said that although fish were dried in the sun, quails, ducks and smaller birds were salted and then eaten.<sup>25</sup> However, the Hebrew verb *sātah* ('to spread out') implies that the quails were spread out on the ground to be dried in the sun for it is used elsewhere to describe how bones (Jeremiah 8.2) and fishing nets (Ezekiel 26.5 & 14) were spread out for this purpose. Hence the Vulgate translates the original of 'they spread out' as 'they dried (*siccaverunt*)'.

On this occasion the consumption of the quails was not to be without incident for we are told that when the people ate the flesh of the quails, an epidemic broke out.

### The Quail Epidemic

The epidemic is described as one of 'a very great plague' (v. 33). The word used for plague is *makkā* which means 'a blow, a wound or a slaughter'.<sup>26</sup> This is not the common word for disease in the Old Testament and when it is used, it implies that the disease referred to is a divine punishment (See for example, Leviticus 26.21; Deuteronomy 28.61 and Isaiah 27.7). Its use gives no indication of the nature of the disease, but it would suggest its acute onset.

#### *When did the epidemic begin?*

Most of the English versions translate Numbers 11.33 to mean that the epidemic started as soon as the people began to eat the meat of the quails. Thus the AV/KJV translation of this verse is as follows:

And while the flesh was yet between their teeth, ere it was chewed, the wrath of the Lord was kindled against the people, and the Lord smote the people with a very great plague.

The RV, NASB, NKJV and JB all translate the verse in a similar manner. The NEB and REB versions vary slightly from it by saying that the people 'had not so much as bitten' the meat before the epidemic began.

This translation is medically unacceptable for there is no epidemic disease known to medicine associated with the consumption of bird flesh which acts in such an immediate fashion, i.e. before the meat has been bitten off and taken into the mouth to be chewed. It is also not acceptable in the context here, for Moses had told the people that they

<sup>25</sup> Herodotus 2. 77 (Loeb edition, vol. 1, 365).

<sup>26</sup> BDB, 646, s.v. *makkā*. 4.

would eat quail meat for whole month until they loathed it (11.20). If they died immediately they raised the meat to their mouth, there could be no possibility of any of them eating it for a whole month. The Hebrew verb translated as 'chew' or 'bite' in the above versions is *kārat* in the Niphal. According to the Oxford Hebrew Lexicon its translation as 'be chewed' in Numbers 11.33 is unique in the Old Testament.<sup>27</sup> The verb usually means 'cut off' or 'cut down', or in a more general sense, 'fail'.<sup>28</sup> If then we take this latter meaning as possible in this context, we obtain a more acceptable translation which understands the epidemic to break out, not before the meat had been bitten off or chewed, but before the supply of quail meat had failed or run out. This is the view taken by the LXX, the Vulgate, the Targums of Jonathan and Onkelos, the RSV, the NRSV and the NIV. These versions all understand *kārat* here to mean 'be consumed', i.e. because it had all been eaten. However, an ambiguity still remains in the English versions for it is not clear whether consumption by the individual is meant, or consumption by the whole company. As Riggans suggests, a clearer translation would be 'before it ran out' rather than 'before it was consumed'.<sup>29</sup>

A difficulty still remains, however, in the presence of the clause 'While the meat was still between their teeth' (v. 33a NRSV & NIV). It may have been this clause with its reference to teeth which led to the translation of *kārat* as 'chewed' which may have been, as Binns suggests, 'a guess from the context'.<sup>30</sup> If we then reject this translation, how are we to understand the reference to teeth? As we have already mentioned, there is no disease related to the intake of meat which can be fatal before the meat has actually been bitten off or been chewed by the appropriate teeth. The best interpretation of this clause may be to regard it as a hyperbolic description of the onset of the disease, indicating how very short was its incubation period, i.e. 'the meat was scarcely between their teeth' (REB) before the disease began to affect them.

#### *What were the features of the disease?*

We are given few details of the disease, but several of its features appear to be suggested by the narrative.

1. It was sudden in onset. This is suggested by the description of the epidemic as a blow from the Lord (v. 33) and possibly by the dramatic reference to the teeth which we have just discussed.

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27 BDB, 504, s.v. *kārat*, Niphal 3. Cf. Koehler, op. cit., 457, s.v. *kārat*

28 BDB, 504, s.v. *kārat*.

29 Walter Riggans, op. cit., 99.

30 L. E. Binns, *Westminster Commentary: Numbers* (London: Methuen, 1927), 74.



2. It was associated with the eating of quail meat from the dead bodies of the birds, which had been spread out round the camp and cured by drying in the sun (v. 32).
3. It was due to quail meat which was supplied on only one occasion and was kept for up to a month thereafter before being eaten, and was liable to have become 'loathsome' (v. 20).
4. It was marked by severe vomiting, even through the nostrils of those affected (v. 20).
5. It could have been related to an over-consumption of quail meat. Those who died were said to have been 'greedy for meat' (v. 34 REB) or to have 'felt a gluttonous craving' for the quail meat.<sup>31</sup>
6. It had a fatal outcome for some of the people (v. 34).

### *What was the nature of the disease?*

There have been a number of suggestions about the nature or diagnosis of the disease. These are as follows:

1. It was the result of overeating.
2. It was a vitamin deficiency.
3. It was an allergic condition.
4. It was hemlock poisoning.
5. It was acute bacterial food-poisoning.

#### *1. Overeating*

This was the explanation given by Abraham Ibn Ezra (1089–1164), the Spanish biblical commentator, and other Jewish commentators.<sup>32</sup> It is an explanation which could be implied in the narrative where we are told that the people who were fatally affected were those who were 'greedy for the meat' (v. 34 REB), and in the words of Psalm 78.29 where the Psalmist says 'they ate until they had had more than enough'.

Cook in the Speaker's Commentary suggests that overeating of quail meat for a whole month would predispose the people to sickness, but he gives no indication of what kind of sickness he has in mind. He adds that 'God's wrath, visiting the gluttonous through their gluttony, aggravated natural consequences into a supernatural visitation'.<sup>33</sup> However, it seems unlikely that gluttony by itself would explain the disease which afflicted the Israelites on this occasion. It may, however,

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<sup>31</sup> Milgrom, *op. cit.*, 73.

<sup>32</sup> *Ibidem*, 92.

<sup>33</sup> F. C. Cook (ed.), *The Holy Bible with Commentary* (London: John Murray, 1871), vol. 1, part 2, 692.

increase the severity of any disease which was directly related to the amount of food eaten.

## 2. *Vitamin deficiency*

The medical contributor to the article on the quail in the *Encyclopaedia Biblica* (1914) was Dr Charles Creighton (1847–1927), the founder of modern British epidemiology.<sup>34</sup> In the section of the article for which he was responsible, he suggested that the various symptoms described in the eleventh chapter of Numbers were ‘sufficiently characteristic of the acute dropsical form of the disease called beri-beri’ to convince him that this was the diagnosis in this case. Creighton supported his suggestion by describing what he regarded as a parallel case from the experience of the illfated expedition of Sir Thomas Cavendish in Patagonia in 1592. In this expedition the sailors kept themselves alive by killing and salting penguins in a similar manner to that which Creighton suggested the Israelites used in dealing with the quails. After some time, a disease resembling ‘wet beri-beri’ broke out amongst the Israelites which he attributed to the breeding of large worms in the flesh of the dried quails.<sup>35</sup>

The disease beri-beri exists in two forms, the ‘wet’ and the ‘dry’, according to whether the heart or the nervous system is affected; it was the wet form which Creighton suggested as the diagnosis here. We know today that both forms are due to deficiency of vitamin B<sub>1</sub> or thiamin usually associated with a diet of highly-polished rice in tropical countries. However, there would have been no deficiency of this vitamin in a diet rich in the flesh of quails, which is known to contain significant amounts of thiamin.

In addition to this, there is no mention of dropsy in the narrative of Numbers and since the onset of the epidemic appears to have been rapid, it is unlikely to have been due to a vitamin deficiency such as wet beri-beri which, as Creighton himself admits, takes ‘some time’ to develop.

## 3. *An allergic condition*

The island of Lesbos in the Aegean Sea is in the path of the annual migration of quails from Africa to Europe and back. These birds descend there to rest as they cross the Mediterranean, when the local people are able to catch them and kill them for food.

34 F. H. Garrison, *Introduction to the History of Medicine* (Philadelphia: W. B. Saunders, 1929), 742–743.

35 G. C. Creighton in *The Encyclopaedia Biblica* edited by T. K. Cheyne & J. S. Black (London: A. & C. Black, 1914), columns 3990–3991, art. ‘Quail’.

In recent years during the autumn migration of the quail, a number of people in Lesbos have become severely ill after eating quail meat and some have died. Dr Theodore Ouzounellis, a hospital physician in Mitylene, the capital of the island, has described a series of twenty-eight serious cases of quail poisoning which needed admission to hospital. One of them died and more would probably have died without the availability of modern treatment. After his experience of these cases, Ouzounellis suggested that this condition might be the same as that which affected the Israelites in the Wilderness of Paran.<sup>36</sup>

The cause of these cases was believed to be an allergy or hypersensitivity of the victims to some unidentified factor in the quail flesh which Ouzounellis calls an 'enzymatic abnormality of the muscular tissue'. In those people who are allergic or sensitive to this factor, the consumption of quail meat causes a massive breakdown of red blood cells producing a severe anaemia and a destruction of the protein of the body muscles which may result in kidney failure—a so-called acute myoglobinuric syndrome.

Hypersensitivity of this kind does occur following previous exposure to the agent which produces such a hypersensitive state. We know that the Israelites had previously been in contact with quails in the desert according to Exodus 16.13, and perhaps even in Egypt before they left. However, although such a syndrome as Ouzounellis describes does appear to exist, it is unlikely that it would explain what happened to the Israelites in the Wilderness of Paran, where the epidemic appears to have been widespread amongst the population and the mortality significantly high.

#### 4. Hemlock poisoning

Although quail were eaten by the Romans, Pliny tells us that there was a prejudice against them, based on their habit of feeding on poisonous seeds.<sup>37</sup> The suggestion that this habit might be the explanation of the experience of the Israelites in the Wilderness of Paran has been advanced in recent times, notably by Dr Edmond Sergent of the Pasteur Institute in Algiers.<sup>38</sup>

Algeria is one of the countries over which the quails pass during

36 Theodore Ouzounellis, 'Some notes on Quail Poisoning', *Journal of the American Medical Association*, vol. 211 (Feb. 16 1970), 1186–1187.

37 'Quails are very fond of eating poison seeds on account of which our tables have condemned them; and moreover it is customary to spit at the sight of them as a charm against epilepsy to which they are the only living creatures that are liable, besides man' (Pliny, *Natural History*, 10. 33: Loeb edition vol. 3, 337).

38 Edmond Sergent, 'Les Cailles Empoisonneuses dans la Bible et en Algérie de nos Jours', *Archives de L'Institut Pasteur d'Algérie*, vol. 19 (Juin 1941), 161–192.

their annual migrations between Africa and Europe and every year cases of quail poisoning occur there. When Sergent began to take an interest in these cases, he found that their symptoms appeared almost immediately after the eating of quail meat and were sometimes alarming, but never fatal. These symptoms included vomiting and diarrhoea together with muscular paralysis. Significantly, they occurred only during the northward migration in the spring when the quails had fed on the seeds of the ripening grains and weeds of north African lands, before they set off across the Mediterranean to reach Europe.

Sergent began to investigate the identity of the poisonous seeds on which the quails might have fed during their journey to the north African coast, and soon incriminated the seeds of the poison hemlock (*Conium maculatum*), a plant which occurs throughout Algeria and Tunisia. This plant and its seeds contain a number of alkaloids, the principal one of which is *coniine*, an intensely poisonous substance.<sup>39</sup> Sergent then proceeded to grind up some of these seeds in a mortar and make a liquid preparation of them, which he fed to some dogs. This produced the same digestive and nervous symptoms in the dogs which he had observed in human cases of quail poisoning. He concluded that these human cases of quail poisoning were probably due to the presence of the poisonous alkaloids of hemlock in the quail meat, derived from the hemlock seeds on which the birds had fed during their northward migration. Following his experiment, he suggested that this might well explain the outbreak of the quail epidemic amongst the Israelites in the Wilderness of Paran.

This explanation of Sergent's appears plausible until we realise that the cases he saw were far fewer and much milder than those amongst the Israelites, and were never fatal.

### 5. Bacterial food-poisoning

Physicians of a former generation spoke of *ptomaine poisoning* and attributed this condition to the toxic effect of certain chemical compounds they called 'ptomaines',<sup>40</sup> which were produced during the decomposition of animal tissues after death. It is now known that these compounds do not cause food-poisoning and that cases of

39 Alexander Nelson, *Medical Botany* (Edinburgh: Livingstone, 1951), 462. Other poisonous seeds on which quails fed according to ancient authors such as Galen and Avicenna, included those of the plants aconite, datura, hellebore and henbane (See Sergent, art. cit., 186, and also Fred Rosner, *Medicine in the Bible & Talmud* [New York: Ktav, 1977], 219).

40 The word *ptomaine* was coined in 1876 by Francesco Selmi (1817-1881), professor of toxicology at the University of Bologna. It is derived from *ptōma*, the Greek word for a corpse, combined with the chemical term *amine*.

food-poisoning which were formerly attributed to them were in fact due to the action of bacteria and the toxins they produced. The suggestion that the quail epidemic which affected the Israelites in the Wilderness of Paran was one of bacterial food-poisoning is the most probable of all the suggestions which have been made.

The epidemic followed the eating of quail meat which had been kept in desert conditions for up to a month after being dried in the sun. In cases where this method of curing had been inadequately carried out, the conditions for the growth of bacteria and chemical decomposition would be ideal.

The eventual condition of the meat is described by the Hebrew word *zārā* (v. 20) which is commonly translated 'loathsome' (AV, RV, RSV, NRSV & NIV) or 'nauseating' (NEB, REB, JB & GNB), presumably due to its state of bacterial and chemical decomposition. The word is a hapax legomenon in the Old Testament and its meaning is therefore uncertain, although it may be related to the verb *zūr*, to be strange or abnormal, and refer to the abnormal putrid condition of the meat which gave it a strange and repugnant smell.<sup>41</sup>

The LXX understands the word to mean that the meat was in a condition which produced *cholera*, a word which the ancient Greek medical authors use for 'a disease in which the humours (*chole, cholai*) of the body are violently discharged by vomiting and stool.'<sup>42</sup> This word is now applied to a specific disease caused by the bacterium *Vibrio cholerae*, but originally meant simply any disease characterised by diarrhoea and vomiting.

In this case it would appear that vomiting predominated. The meat was nauseating and made the people sick, and the vomitus was so copious that it came out through their nostrils as well as through their mouth, as Preuss suggests is the meaning of verse twenty.<sup>43</sup>

There are two main varieties of bacterial food-poisoning. In the first variety the bacteria and their toxins originate usually from other human beings, and in the second variety they come from animals including game-birds and table-birds and their eggs. This second variety is due to bacteria of the *Salmonella* group and the organism responsible for the quail epidemic amongst the Israelites was most probably a member of this group.

41 T. R. Ashley, op. cit., 212, and BDB, 266, s.v. *zārā*.

42 H. G. Liddell & Robert Scott, *A Greek-English Lexicon* (Oxford: Clarendon Press, 1961), ninth edition, 1997, s.v. *cholera*.

43 Julius Preuss, *Biblical & Talmudic Medicine*. Translated from the German and edited by Fred Rosner (New York: Sanhedrin Press, 1978), 559.

**The Quail Miracle**

The book of Numbers has no doubt that the feeding of the Israelites with quail meat was the result of a miracle. It was the Lord who promised through Moses that he would give them meat enough to last for a whole month (11.18–20). It was the Lord who sent the wind which drove the quail in from the sea (v. 31) and it was he who struck the people with the great plague (v. 33). This is also the view of the Psalmist in Psalm 78.26–31.

Now that we have suggested that the epidemic was one of bacterial food-poisoning caused by the consumption of infected quail meat, the question arises of whether we can still maintain that the incident was also miraculous. Gray says that we cannot do so and that what he calls 'the rationalistic explanation' of the incident 'merely betrays a lack of literary sense on the part of those who offer it'.<sup>44</sup>

However, the natural explanation of an incident need not deny its supernatural origin and significance; a supernatural event need not be unnatural in its character and mechanism. What was miraculous in the provision of the Israelites with quail meat was not how it was done, but why, when and where it was done.

**Abstract**

The article discusses in detail the identity of the quails and the epidemic associated with them in the wilderness narrative in Numbers 11 and concludes that it was a form of bacterial food poisoning.

44 G. B. Gray, *International Critical Commentary: Numbers* (Edinburgh: T. & T. Clark, 1903), 119.

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