

The dramatic story of how hemophilia has affected the recent history of the world.

Blood Royal

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ROYALTY is based on the hereditary principle. The crown of England descends to the eldest son of the late king, or if no such heir exists, according to a not very complicated set of rules. That is an example of legal inheritance. But royalty also illustrates biological inheritance, which follows rules of its own.

One of these, hemophilia, has played a dramatic part in recent European history. We shall see how Queen Victoria played a minor, but not insignificant, part in bringing about the Russian and Spanish revolutions, and how a rather more materialistic outlook on the part of kings and their advisers might have altered the course of history.

When human blood is shed, it generally begins to clot in a few minutes, the time depending, among other things, on the temperature. The clotting is due to a very complicated chemical process which we need not describe in detail. We are gradually learning to control it. In a case of

hemophilia shed blood takes anything from thirty minutes to a day to clot. Hence small cuts may be fatal, and a tooth extraction is a dangerous operation. Most hemophiles bleed into their joints and develop a stiffness like that of chronic rheumatism. Although the disease is not painful, apart from such secondary effects as this, it makes ordinary life very difficult, and is generally fatal in the early years of life.

True hemophilia, with one or two very doubtful exceptions, only occurs in males. It is not very rare. At the present moment there are at least thirty-five hemophiles alive in greater London, probably twice as many. If they had a normal expectation of life, there would be more than a hundred. So probably well over one English baby boy in 50,000 is born a hemophilic.

Hemophilia is a hereditary disease, though not in the ordinary sense of that word, since it is never (save in one case, where it may have been

derived from the mother) handed down, like a crown or an estate, from father to son. On the contrary, although it generally occurs in several males in one family, it is always found that they are related through women.

II

The facts regarding hemophilia are as follows. Every nucleus of every cell (except some cancer cells and the cells such as spermatozoa destined for reproduction) in the human body contains forty-eight chromosomes, which can be seen with a microscope when the cell divides. A woman has twenty-four pairs, a man twenty-three pairs and two unequal chromosomes called the X and the Y . A woman has two X chromosomes and no Y . For that reason the usual symbol for man is XY and for women, XX .

When an egg is fertilized, one chromosome of each pair is ejected in a small granule called the second polar body, so that only twenty-four are left. In the testicles, cells called spermatogonia divide so as to give spermatozoa carrying only twenty-four instead of forty-eight chromosomes. Half receive the X and half the Y . An egg fertilized by a spermatozoön carrying an X gives rise to an embryo with two X chromosomes, and therefore female. One fertilized by a spermatozoön carrying a Y gives rise to a male.

Now the X chromosome includes an ultra-microscopical particle called a gene, which, like the rest of the chromosome, reproduces itself at each cell division, and which is somehow concerned in making a substance needed for blood coagulation. The Y chromosome, which is a good deal

smaller than the X , carries no genes of these kinds. In a very small proportion of X chromosomes, the gene concerned in clotting is replaced by an inactive gene. A man with such an inactive gene is a hemophilic. But as one normal gene will do the work of two, a woman with one active and one inactive gene is generally normal.

The inactive gene can be handed down from a mother to her son or daughter, but by a father to his daughters only. If we represent a normal X chromosome by X , and one carrying the inactive gene for hemophilia by X' , we have the following situation: a hemophilic father ($X'Y$) and a normal mother (XX) produce normal children. The sons (XY) do not transmit hemophilia to their descendants; but the daughters (XX') transmit it to half their sons, on the average; and they transmit the gene to half their daughters. Women of constitution XX' are called heterozygotes. These in turn can transmit it to their descendants, and so on. It is doubtful whether hemophilic women exist. They should theoretically be produced from the union of a hemophilic ($X'Y$) man and a heterozygous (XX') woman. Half the sons and half the daughters of such a union should, on the average, be hemophilic. But unions of this kind are, of course, excessively rare.

The process by which a normal gene becomes a hemophilic gene is called mutation—an uncontrollable event which occasionally interferes with the normal process of heredity. It takes place at the rate of about once in 50,000 human life cycles. That is to say, in each generation about one gene for normal blood-clotting in 50,000 becomes a gene for hemophilia. As a result of this process, the whole human

race would become hemophilic in a few million years were it not negated by natural selection, which kills the hemophilics. The same is true for other undesirable genes. Thus the actual frequency of hemophilia represents a balance between the opposing processes of mutation and natural selection.

Hemophilia has occurred in a number of male descendants of the late Queen Victoria: in one son, and in at least three grandsons and six great-grandsons. It is quite likely that several other males have been hemophilic. 'The fierce light which beats about a throne' is an artificially manipulated spotlight rather than the normal light of day, and does not illuminate all the defects of royalty.

The present British royal house, the descendants of King Edward VII, has not been subject to hemophilia. As he was not a hemophilic, and none of his descendants have married into a hemophilic family, the Windsor dynasty has no hemophilic genes either on the surface, so to say, or below it, and there is no more likelihood of a hemophilic appearing among them than in any normal family.

III

Here is a list of Victoria's hemophilic descendants, illustrated by the table on page 29. In the table only the heterozygous and hemophilic descendants have been named. Several of Victoria's children were not hemophilic or heterozygous, and their descendants have been left out of the table for clarity's sake.

Leopold, Duke of Albany, Victoria's son. Was an invalid from birth. De-

scribed as having 'a skin as thin as tissue paper.' This is probably incorrect. But a scratch which a normal child would not have noticed must have bled for days, thus giving an impression of thinness. His illness included an intestinal hemorrhage in 1875. (See letters and diaries of Queen Victoria.)

Prince Frederick William of Hesse, Victoria's grandson. When two years old he bled for three days from a cut on his ear. A little later he died as the result of a fall from a window.

Princes Leopold and Maurice of Battenberg, sons of Victoria's heterozygous daughter, Beatrice. Prince Maurice died of wounds while fighting in the British army in 1914. If he was hemophilic, this argues great courage on his part, as he must have known that a trivial wound might be fatal.

Princes Waldemar and Henry of Prussia, great-grandsons of Victoria. The latter died after a fall, apparently from meningeal hemorrhage.

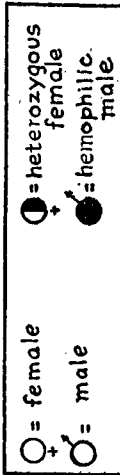
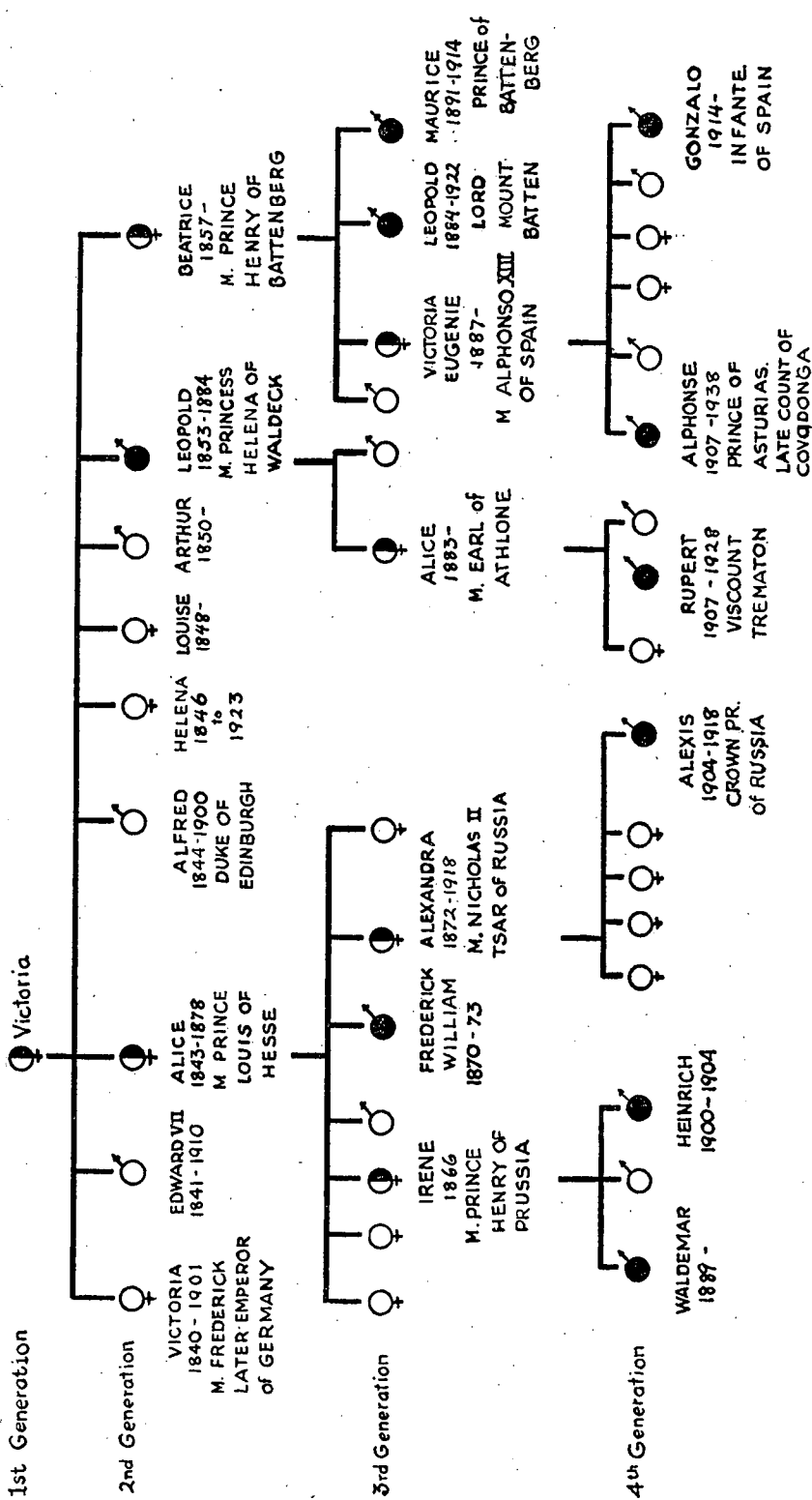
Tsarevitch Alexis of Russia, great-grandson of Victoria through her daughter Alice and her grand-daughter Alexandra of Hesse. He is well known to have been a hemophilic.

Rupert, Viscount Trematon, Victoria's great-grandson. Died of uncontrollable bleeding after a motor accident.

Alfonso, Prince of Asturias and later Count of Covadonga, also descended from Victoria through Beatrice. Died recently of hemophilia after an accident.

Infante Gonzalo. Died of uncontrollable bleeding after a motor accident.

We must now turn to the origin of the disease. Queen Victoria's half-brother, her three maternal uncles and her maternal grandfather all lived long enough to marry and beget children. We may take it that they were not hemophilics, for around 1800 bleeding was so extensively carried



Only heterozygous and hemophilic descendants are named.
Several of Victoria's children were not hemophilic or heterozygous, as, for example, Edward VII and Victoria, later Empress of Germany. Their descendants are not mentioned.

out by the medical profession that hemophiliacs would not have survived for many years. Nor have I been able to trace hemophilia either among her mother's sisters' sons or in the house of Reuss from which her grandmother was derived. The gene must have originated by mutation, and the most probable place and time where the mutation may have occurred was in the nucleus of a cell in one of the testicles of Edward, Duke of Kent, Victoria's father, in the year 1818.

The event in question could not have been observed with the most powerful microscopes. It initially affected a single gene, that is to say, a particle much less than a thousandth of a millimeter in diameter. But it had an appreciable effect on world history. As Marx wrote to Kugelmann in 1871: 'History would be . . . of a very mystical nature if "accidents" played no part. These accidents themselves fall into the general course of development and are compensated again by other accidents.'

IV

This particular accident of mutation was definitely detrimental to the cause of monarchy and to the cause of capitalism, which uses monarchs as its agents. The Tsarevitch Alexis, son of Nicholas, the last Tsar of all the Russias, was a hemophilic. The monk Rasputin obtained a hold over his parents through his alleged ability to control the boy's bleeding. This may have been spurious, but it is possible that by hypnosis or a similar method he could cause contraction of small arteries. Whether or not Rasputin was able to influence the Tsarevitch, he certainly influenced his parents. And

his murder by a group of aristocrats did something to break up the unity of the ruling class and thus to facilitate the Revolution of March, 1917. Further, the fact that Alexis was a hemophilic must have militated against the proposal that he should succeed his father when the latter abdicated.

In Spain, too, the heir-apparent was a hemophilic at the time of the Revolution which dethroned his father Alfonso XIII in 1931, and the second son is said to be an invalid. These facts unquestionably made it harder for moderate monarchists to propose the replacement of the reigning sovereign by the heir-apparent, the solution which commended itself to the British ruling class in 1936.

The appearance of hemophilia in the British royal family in the nineteenth century was an accident, like Blanqui's illness at the time of the Paris Commune and many other details of individual human biology which have affected history. But its appearance in the royal families of Russia and Spain was not an accident at all. By 1853, when Prince Leopold, Duke of Albany, the first of the royal bleeders, was born to Queen Victoria, the heredity of the disease had been understood for half a century. It was known that the mother of one bleeder might produce more, and that his sisters might have hemophilic sons. Nevertheless, all Queen Victoria's daughters married, though one (Princess Louise, Duchess of Argyll) is childless. And of the four who had children, two, and possibly three, had hemophilic sons.

Considering the expense and ceremony which are associated with royal marriages, and the importance attached to the personality of kings, it

might at first sight have been thought that some care would be taken in choosing the mothers of future royalty. Actually, however, importance is attached to their ancestry from the legal, but not from the biological point of view. Presumably Nicholas and Alfonso knew that their brides had hemophilic brothers, which meant that they might be expected to have hemophilic sons, but their education had been of such a character that this meant nothing to them. They or their advisers may have consulted physicians. We do not know, and are not likely to know, whether in either case the court doctor advised against the marriage. And I doubt whether a distinguished medical man outside court circles who had wished to warn Nicholas or Alfonso of the dangerous character of his intended marriage would have been able to do so, either personally or in the columns of the press.

Members of the royalty are shielded against unpleasant facts and must suffer in consequence. The hemophilia of the Tsarevitch and the Prince of Asturias were symptoms of the divorce between royalty and reality.

Under the bill to legalize eugenical sterilization which it is intended

shortly to bring before Parliament, it is proposed that persons who are deemed likely to transmit a grave physical defect to later generations be sterilized, though only with their own consent. If that law had been in force shortly after the birth of Prince Leopold, Queen Victoria herself and the future Empress of Germany and Princesses of Hesse, Schleswig-Holstein and Battenburg, with the future Duchess of Argyll, should have all been sterilized.

Ruling classes perish through incompetence rather than injustice. The story illustrated in our diagram is the record of one little piece of incompetence in our ruling classes. In the Middle Ages care was taken, in terms of prevailing biological theories, to obtain kings of the desired sort. I believe it was an act of high treason to seduce the wet-nurse to the heir-apparent of England, thus corrupting the blood royal. The blood royal has actually been corrupted by snobbery, which puts 'high' birth before health. There is a great deal to be said for eugenics. I trust that I have shown that it is not only among the 'lower' classes that eugenic principles might be applied.

A description of Hitler's 'eagle aerie' in the mountains; the new travel service on German ships; a non-Aryan who does not feel himself branded.

The German Scene

I. HITLER'S PALACE IN THE CLOUDS

Translated from the *Telegraaf*, Amsterdam Independent Daily

LAST fall the French Ambassador François-Poncet, upon being recalled from Germany, went to pay his farewell visit to Hitler at his mountain retreat near Berchtesgaden. The car which Hitler had put at his disposal suddenly left the familiar road. François-Poncet called out to the driver: 'You are going the wrong way.' But the latter only shook his head and smiled.

The road wound higher and higher, more and more hairpin bends had to be passed and the drops became increasingly steep. About eight hundred feet from the top of the mountain the car slowed down. It went very slowly along the gray cliff. A sharp turn to the left and the car seemed to drive directly into the mountain. With increasing amazement, the Ambassador perceived an enormous bronze

gate which opened automatically. The car entered a grotto.

A grotto in the mountain! It was like a tale out of the Arabian Nights! The walls were of marble that glittered in the indirect lighting, and at the further end of the passage gleamed a metal elevator. The car drew near to it and stopped. François-Poncet entered the elevator, which was carpeted in red and had comfortable plush seats. It shot up about five hundred feet, then suddenly it stopped. The party emerged into the light of day, into a spacious pavilion constructed mainly of glass. There stood Hitler, smiling, awaiting his surprised guests!

The eagle's aerie of the Führer! This is perhaps the best description of the fabulous pavilion which Hitler has blasted out of the rock, in deepest