AN EARLY CHAPTER OF THE STORY OF
HOMO SAPIENS.¹

BY H. J. FLEURE, D.Sc.,

PROFESSOR OF GEOGRAPHY IN THE UNIVERSITY OF MANCHESTER.

FINDS relating to prehistoric man were first systematically studied in western Europe, and there naturally grew up, half unconsciously, an idea of a long course of evolution in situ with some notable movements from one part of our quadrant of the globe to another. By degrees a scheme of successive stages was worked out as follows² (in broad outline):—

N. AFRICA and parts of the MEDITERRANEAN region 
S.W. and parts of 
W. EUROPE
CENTRAL EUROPE
AZILIAN and TARDENOISIAN → TARDENOISIAN
MAGDALENIAN
CAPSIAN
AURIGNACIAN
SOLUTRIAN
M O U S T E R I A N
ACHEULIAN (with variants)
CHELLIAN
PREMOUSTERIAN
PROTOCHELLIAN

The Chellio-Acheulian sequence is characterised by the shaping of flint cores to form hand-axes of a few characteristic shapes showing very fine workmanship in many cases, and there are some smaller types of implement. Thanks especially to the work of Breuil, it has

¹ Based upon a lecture delivered in the John Rylands Library, on the 13th January, 1932.
² See Obermaier, H., El Hombre fósil (Madrid, 1925); Burkitt, M. C., Prehistory (Cambridge, 1925); Breuil, H., Les subdivisions du paléolithique supérieur (Congr. Internat. d’Anth. et d’Arch. préhist. (Genève, 1912)).
become increasingly clear that several industries (Clactonian, Micoquian, Levalloisian, etc.), often using flakes more than cores, are quasi-contemporary with the Acheulian, and the Levalloisian and Micoquian survive it. In North Africa, also, a number of cultures are recognised which complicate the Mousterian and the Capsian sequences there. Burkitt is responsible in large measure for suggesting the useful term Middle Palaeolithic to cover the Mousterian industries between Acheulian and Aurignacian. The Piltdown skull, the Heidelberg jaw, and Pithecanthropus and *H. soloensis* from Java cannot be associated with facts of culture; Sinanthropus from China, which Elliot Smith,¹ as well as its discoverer, relates to Pithecanthropus, and to the Piltdown skull in a broad sense, is linked with what seems to be a pre-Mousterian culture. In Europe and the Mediterranean region there is nothing known of skeletal remains of man associated with the Chellio-Acheulian phases. With the Mousterian phase in Europe is associated a type of man, sometimes named Neanderthal race from the locality of the first specimen discovered. With the Aurignacian and Capsian cultures skeletal evidences of *homo sapiens* appear in some numbers and with certain diversities *inter se*, suggesting that this does not represent the birth of our race, but only its appearance or increase in numbers in our part of the world.

Asia, usually either Central Asia or South Central Asia, has often² been credited with being the original home of man, and there has been a tendency in some quarters to suggest that *homo sapiens* also spread thence. Studies of the distribution of cultures are still very incomplete pending further explorations, but, whatever may be the truth about the genus homo, the study of distribution thus far does not support the idea of such an origin for *homo sapiens*. It is useful in this connection to refer briefly to the distributions of certain of the cultures mentioned above.

The Chellio-Acheulian culture had a very wide distribution. In Europe it is characteristic of Spain, Portugal, France and south England, but its absence from south Italy and Sicily has been demon-


Evidence is ceaselessly accumulating of its occurrence in Africa, save to the north-east of a line from Bougie to Gafsa, in the North, in parts of the Sahara, in and near the Nile Valley, in Somaliland, in Kenya, Tanganyika and south Africa. Its occurrence in Palestine is demonstrated, and it is highly probable that parts of Arabia also knew it. South India and Gujarat have yielded analogous implements, but apparently they are not yet known from far eastern, central or northern Asia; nor have they been found in eastern and central Europe. The relation of this culture to what is now the Arabo-African arid zone and its borders is evident, and its occurrence elsewhere may be interpreted with considerable probability as an extension from that zone or those borders, always allowing that the borders need to be interpreted broadly, particularly in Africa, in the present condition of knowledge.

The early cultures using flakes were originally ascribed in a general way to a Mousterian phase, which, from finds in Europe, was held to be associated with the Neanderthal race of man. Modern researches, in which Breuil has taken a leading part, but which have not yet reached the stage of systematic exposition, are introducing some modifications of attitude. The Neanderthal type of man is associated with some flake-tools. The classification of flake-tools is becoming much more complex and some of them are now held to have been contemporary with Chellian and Acheulian tools in Europe. There seems to be a possibility that, wherever the idea of using mainly flake-tools arose, it gained greatly in complexity and importance when it got into the zone in which the Chellean-Acheulian sequence was developing or had developed, and there are Acheulian-Mousterian transitions; while the use of large flakes for making fine Acheulian coups-de-poing is widespread, especially in Africa. The possibility of the origination of some flake cultures within the zone discussed for the Chellean-Acheulian series must not be dismissed, though the probabilities seem to be that much occurred rather to the north and east. We must look forward to a future clearing up of this matter of flake industries and a probable restriction in the use of the name Mousterian. In the meantime it must be recognised as unsafe for the present to

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argue *ubi industria mousteriensis, ibi homo neanderthalensis*, as is sometimes done. It may be added here that one feature has been regarded as the great characteristic of developed Mousterian flaking, namely the preparation of a striking-platform before flaking, and the knocking of the prepared pointed flake off the core in such a way as to give a bulb of percussion near the base.

That the use of flakes of flint established itself as a general practice in the course of time is at least evident, and it is probable that some of the industries now being more or less distinguished from the general assemblage known as Mousterian were the parents of the next, and, for the purpose of this essay, the most important phase, namely that which Breuil first made distinct in France and named Aurignacian, with its variant in North Africa called Early Capsian. In these industries there appears a refinement and variation of technique. It is now known that, by the use of gum, these people were able to fasten stone implements into wood and so to make stone-barbed shafts, and ultimately arrows. They had knife-like implements and many other forms, no longer only the few characteristic of the earlier cultures. There had been a liberation of initiative. It showed itself in the rock drawings and drawings on bone, and the modelling in clay, stone and ivory that is so well known and that demonstrates it at least as well, as do the implements, which indicate, especially in the barbed shafts, a new mastery in hunting. The occupation sites seem to have been held for longer periods, and were often cave-shelters. Deliberate burial is far more often found, and it seems reasonable to suppose that this is not altogether the result of more lucky finds,—and with the dead there may be not only implements but ornaments such as shells. Leakey has found in Kenya two fragments of pot, one of which was the baked clay-lining of a grass-basket. Until more pottery has been found with this culture it remains possible to argue that it is "accidental," *i.e.* that a clay-lined, or other, grass-basket got baked rather than that a woman set out to make and bake a pot. We are not, however, far from the origins of pottery in any case, and Leakey has actual pots from a later phase of this culture in East Africa, to which he has given the name of Elmenteitan, and which in his opinion

still shows no sign of agricultural activities. On the whole, opinion
as to modes of life is best kept fluid during the present rapid accumula-
tion of knowledge.

At present it looks as though the Aurignacian, or early Capsian,
culture had evolved and spread mainly within the area associated
with the early Acheulian culture, especially in north and east Africa
and southwest Asia. It spread to the Iberian peninsula, France, and
Britain; but it also reached Moravia, maybe along some east
European way from Palestine. In Europe the Aurignacian culture
appears to succeed the Mousterian, in east Africa cultures closely
allied to these two types occur apparently in the same period, but,
in Kenya, do not appear to mix. In Rhodesia, Armstrong ¹ finds
them at first side by side and then, apparently, fusing. In S. Africa ²
one finds evidences of cultures that mingle the two traditions, and it
seems probable that further study will give an analogous conclusion
as regards a more or less corresponding industry in India. As Sollas
long ago suggested, the stone industry of the native Australian of
recent generations retains, intermingled, features of several of these
palæolithic cultures, and probably traces of later ones.

Whatever may be the truth concerning the early home of the
Mousterian group of industries, there seems little doubt that the
Capsian-Aurignacian group belongs by birth to the same zone as the
Chellio-Acheulian sequence. In both the European stations give
indications, especially from their distribution, that their cultures were
derived from the Arabo-African Zone already mentioned. The
spreads from Africa to Europe occurred apparently via Mauretania
and Spain, for, as already stated, there is no trace of these industries
in S. Italy and Sicily. The straits of Gibraltar and those between
Tunis and Sicily are now usually thought to have been open all the
time.³

One of the most outstanding facts concerning the Capsian-Aurig-
nacian group of industries is that the increased prevalence of definite

  Anh. Inst.," bx., 1931, pp. 239-76.
² Goodwin, A., and van Riet Lowe, C., *Stone Age Cultures of S. Africa*,
³ Vaufrey, R., *La question des Isthmes méditerranéens pléistocènes*,
  "Rev. Geogr. phys. et Geol. dyn.," 1929.
burials has led to the preservation of a number of skeletons; and these, wherever they are found, belong to *Homo sapiens*. Until quite recently it was necessary to state categorically that no previous traces of our species (in the strict sense) were known. The cultures mentioned above were held to be those of precursors. The problem is being rediscussed in the light of new finds which are awaiting full description. The skeleton found in 1913 by Reck\(^1\) at Oldoway, Tanganyika, was undoubtedly a specimen of *Homo sapiens*, and it was extracted from a layer which subsequent research has shown contained tools of the Chellio-Acheulian series, though these tools could not be said to be definitely associated with the skeleton. Leakey\(^2\) hesitated to accept the attribution of the skeleton to this layer until he had examined the site, but a visit convinced him of the truth of Reck’s claim. Difficulties have suggested themselves to the minds of some who have read the notices of these discoveries. The skeleton is complete, as though it had been deliberately buried, and, if so, the question \(^3\) has been asked “Might it not be of long subsequent date and interred in that stratum?” Those who have worked on the spot claim that this latter possibility is ruled out. The matter seemed likely to remain in a state of suspense, when the situation was changed by the discovery of remains of *Homo sapiens* by Leakey\(^4\) near Lake Victoria in corresponding strata. This strengthens the case for accepting Reck’s view of the Oldoway skeleton, but, for such an important conclusion, the evidence must be allowed to accumulate and the interpretation of every detail carefully checked to ensure general acceptance. All that can be fairly stated at present is that there are increasing possibilities of throwing back the appearance of *Homo sapiens* on earth far into the Lower Pleistocene, at any rate in Africa. Some who have meditated on the implements of the Chellio-Acheulian series have long felt that at any rate the best would be found to be


the work of *Homo sapiens*. This speculation is not yet verified, for, even if the new discoveries in Kenya and Tanganyika are found to have the implications claimed for them, all we shall know is that *Homo sapiens* was contemporary with the Chellean-Acheulian series of implements. Needless to say, the publication of full reports by Reck and Leakey is awaited with keen interest.

The very great majority of Neanderthal type skeletons belongs to Europe, and the type is claimed to have been akin to Sinanthropus from the Peking area. These points suggest that this variety of *Homo* belonged to the northern hemisphere, and, as already stated, we do not yet know whether the African Mousterian, or, to use Burkitt’s term, Middle Palaeolithic, tools were the work of this type or of *Homo sapiens* or of some other variety. There is nothing impossible in the simultaneous existence of two types, one belonging to Eurasia and the other to what is now the Arabo-African arid zone and its borders, with extensions to Europe and to S. Africa and India.

Whatever may be the ultimate result of the discussion on east African discoveries, we shall no longer be able to rule out the possibility of an early Pleistocene occurrence of *Homo sapiens*. This possibility is strengthened by the fact that when the specimens of *Homo sapiens* associated with Aurignacian cultures are studied they are seen to show some diversities. If *Homo sapiens* had a more or less unitary origin, as seems probable on many grounds, he must have had a longish history before Aurignacian times.

The skulls found with upper Palaeolithic associations have recently been ably re-examined by Morant\(^1\) with remeasurement.

Comparing the assemblage as a whole with almost any modern one, certain features stand out. The brain case is capacious and its length is specially great. Very much oftener than among most modern populations the cranial index (proportion of breadth to length) is decidedly low (74 or less). In several cases basi-bregmatic height is greater than the maximum breadth of the cranium, and in others it is probable that this relation would be found were the skulls complete enough. Often, again, there is marked prognathism, and zygomatic arches tend to project laterally. The orbits are very variable but

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usually low (orbital index, or ratio of orbital height to orbital horizontal breadth, often 70 or less as against a common value of 85 and over in modern men).

Some contrasts between skulls and skeletons found with Aurignacian and Solutrian cultural associations should be noted.

The Cro-Magnon skull (No. 1, old man) is very long and moderately narrow, with its basi-bregmatic height considerably less than its maximum breadth; the face is short and very broad with powerful zygomatic arches, the nose is narrow and prominent, the chin projects strongly, the orbits are low, the brow is strong, but brow ridges do not stand out. Stature is high. The Combe-Capelle skull is also very long but extremely narrow, with the basi-bregmatic height greater than the maximum breadth; the face is long, but the zygomatic arches are strong, the nose is rather broad, the chin is rather weaker than in Cro-Magnon, the orbits are not so low as in the Cro-Magnon skull; the brow ridges are well developed. Stature is short.

One male skeleton from the Grotte des Enfants, Grimaldi, resembles that from Cro-Magnon in many features. Two males from the Barma Grande cavern, Grimaldi, have the short face, low orbits, and tall stature of the Cro-Magnon man, but have very high and extremely narrow heads of very large cranial capacity. One female from Barma Grande appears more like the Combe-Capelle man. The Grotte du Cavillon, Grimaldi, has yielded tall men, with broad faces, low orbits, and narrow noses, presumably akin to the Cro-Magnon man, but extremely narrow headed. On the other hand, the Grotte des Enfants, Grimaldi, at a lower layer, has yielded an old woman and an adolescent male with extremely narrow heads of marked basi-bregmatic height; many primitive characters have been claimed for these two specimens and they have unfortunately had the name “negroid” attached to them.

The Brünn skulls are of great length and height, and very narrow, with brow ridges strong. The Brüx skull shares the same characters on the whole.

Finds were made many years ago at Solutré, and further skulls of Aurignacian age were obtained there in 1923. These are much more mesaticephalic than most of the other skulls of Aurignacian age; one skull may even have been very brachycephalic, though in the case of this individual the measurement is very uncertain. Předmost in
Moravia has also yielded a number of skeletons supposed to be of Solutrian age. These are mostly very narrow headed, but the height is less than the maximum breadth in those cases in which it could be measured.

From deposits with Magdalenian associations one has some cases with smaller skull-length measurements and consequently moderately low cranial indices (ca 74-75) as from La Faye Bruniquel, Laugerie Basse, Sorde. But one also has the Chancelade skull in which extreme narrowness and height are most noteworthy, and the orbits are higher than in other Palaeolithic skulls, with the possible exception of one of the females from Solutré. Two skulls from Obercassel, near Bonn, are of this date; the male one has a short broad face, narrow nose, and strong chin, combined with a high head, strong brow ridges, and short stature.

Without attempting to classify these early skulls and skeletons in the present state of knowledge, it seems fair to say that among them one notices what may be provisionally called a mode of growth much more prevalent than it is among all but a few populations of recent times. This gives the skull of extreme narrowness, and great relative height, often with a marked sagittal crest. Accompanying this one often finds strong brow ridges and strong zygomatic arches. The indications are that the temporal muscles were strong and the frequent prognathism (prominence of the mouth) supports this idea. Some, like the Cro-Magnon and related skulls, have a different growth, rather more in width and relatively less in height, but most of them, as well as those of the high type, are remarkable for their length. The finds of Solutré, however, indicate forms of skull more akin to those of the great majority in most European populations of the present day.

The matter obviously awaits accumulation of data, and, judging from the change in the amount of data in the last few years, there is considerable hope of much more knowledge in the next generation.

For the present, the above-mentioned growth-tendencies may be borne in mind; and the first, namely that in which there results a skull of marked narrowness and height with strong brows and, often, a sagittal crest, is of interest because it is well represented in both Europe and Africa in ancient deposits and burials, and because of its apparent survivals at the present day. It is evident from preliminary notices that the ancient skulls found by Leakey in Kenya include some of extreme
narrowness and considerable height, but a full account is not yet published.

The interest of these features in ancient skulls is much enhanced by certain points in the anatomy of some modern groups. The native Australian has a very narrow head, which, in North Australia at any rate, is relatively high; the brow ridges are prominent, the cheek bones are strong, the jaws and teeth are powerful. Some old American skulls, including the Lagoa Santa specimens, have a number of these characters. Broom has drawn special attention to the "Australoid" character of some South African skulls, ancient (but undated) and modern. The characters appear in Fiji, Papua, Ceylon and India and apparently among the Ainu and in prehistoric Annam. In fact, if one begins a line of migratory drift somewhere in the Arabo-African arid zone and follows it southward or southeastward or eastward, one ultimately reaches groups in which this form of skull occurs. In Western Europe at the present day or for recent times the type has been noted in Sardinia by Duckworth, in Tras-os-Montes (Portugal) by Da Costa Ferreira and Giuffrida-Ruggeri, in the Dordogne basin (France) by Collignon, and in Wales.

1 Turner, Sir W., Aborigines of Australia, "Trans. R. S. Edin.," xlvi., 1908; xlvii., 1910.
by the present writer, and it doubtless occurs elsewhere. In all these cases it is only an element in a varied population, usually in sparsely peopled remote corners where only small numbers of really indigenous folk are available for observations. Collignon's observations in the Dordogne are the more remarkable in that he distinguishes this type from the "type Cro-Magnon" and he was working years before the discovery of the Combe-Capelle, Prédomost, and other skulls. The numbers are not altogether satisfactory in the statistical sense, but, when one finds that a few comparable and remote districts have, in each case, a fair number of the extremely narrow-headed people, and adjacent districts do not yield more than one or two strays, if any at all, there is some ground for the argument that they are survivors of an ancient type preserved here and there in Western Europe though usually submerged in that part of the world by other types. In Australia, where isolation has been fairly complete from early times until the nineteenth century, this skull form, on the other hand, is the typical one.

It is unfortunate that, twenty years ago, the name Neanderthaloid was suggested for this skull form though apparently without the intention of suggesting kinship with Neanderthal man. The name has, however, sometimes been taken to imply the idea of such kinship. This idea has been analysed and found wanting by several students, and one of the most complete of these analyses is that by Morant.

We have now reached the position that a population of *Homo sapiens*, with a marked tendency towards a very long and narrow form of skull having a basi-bregmatic height as great as or greater than the breadth, was characteristic of the Aurignacian phase of culture in several, but not necessarily all, areas where that culture is found. It has further been argued that this culture extended its domain from what is now the Arabo-African arid zone and its borders, especially into Europe. The question is left open for the present as to whether Kenya colony should be included, broadly, in the borders of the arid zone just mentioned, or whether it should be looked upon as a very early home of *Homo sapiens*, or whether it is a region into which the

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Aurignacian culture extended southwards from the arid zone, much as it spread northwards into Europe. Later, attention was drawn to the fact that cultures which seem to blend Aurignacian and Middle Palaeolithic (and sometimes other) contributions appear to be traceable in S. Africa, India, Australia, etc. The occurrence of the very narrow skull with height greater than maximum breadth, often with brow ridges, strong cheek bones and powerful jaws and teeth, among the people of remote corners of S. Africa and India and America, and among the Australians, is the last stage of the argument that suggests drift from the Arabo-African arid zone, and lingering survival in ultimate corners.

It is important, next, to consider the Arabo-African arid zone a little further. It now gets very occasional rainstorms locally here and there, with more moisture on the Tibesti and other highlands of the Central Sahara and the high western edge of Arabia, especially towards the south. Misses Caton Thompson and Gardner¹ have given preliminary accounts of fossil springs in the Kharga oasis, in which oasis some water can still be obtained from wells. In other words, there is evidence of former existence of many more springs than now function; and finds of implements, these explorers show, indicate a marked diminution of water supplies about the end of the Palaeolithic age, whenever that may have occurred. The great wadis of the western Sahara are thought² to have had water in them within human times, and finds of animal remains as well as of human implements seem to indicate strongly a former moister condition, though it may well be that large areas in the eastern Sahara, for example, were arid even then.

Students of climate make the point that, when large parts of Europe were covered by ice, the cold dense air over the ice would prevent the ingress of the cyclones and westerly winds which now give rain, especially in winter, to north-west Europe. In exceptionally cold spells even now it seems that these cyclones and westerlies are buffeted off western Europe and may get in along the Mediterranean. Under the much severer conditions of an Ice Age this may have been a much

more marked effect, and north Africa and Arabia would be likely under such circumstances to get more moisture, at any rate on such parts as were so situated as to catch some rain. The lower temperature of high land in such a period would increase rainfall near the equator as well, and there is abundant evidence of former greater extension of glaciers, for example, on Mount Kenya. The argument has thus been built up by Gregory and, following him, by Brooks, Leakey and others that a glacial period in Europe and Central Asia would be quasi-contemporaneous with a pluvial period in Equatorial Africa. Attempts have been made, and are being made, to try to equate particular glacial periods of the Northern Hemisphere with particular pluvial periods near the equator, and particular periods of moisture in north Africa. The period of Chellean-Acheulian sequence of culture in north and east Africa seems to have been one moist phase, and at some time in the history of that culture, the evidence shows it was in an interglacial interval, it extended its domain from the Arabo-African zone to Europe. Students would identify this interval with the period between the Mindel and the Riss glaciations of the Penck series; Simpson thinks it was probably the interval between the Riss and the Würm glaciations of the Penck scheme. Others, again, fear to apply the Penck scheme much beyond the Alps, and that fear is strengthened by the fact that research is showing the occurrence of considerable changes of land levels, not all in the same sense, in Pleistocene Europe, and apparently in Africa and Arabia as well. These difficulties, however, hardly touch the general idea of a correlation between glaciation in Europe and rainier conditions over large areas in Africa and probably in Arabia.

A speculative point may be added here. If, as seems probable, the Chellean-Acheulian culture-series originated in or near the Arabo-African zone discussed in this lecture, and from its distribution and some of its details one allows that it may be a part-ancestor of Aurignacian culture, it may well have been associated with close forerunners of Homo sapiens or, if Leakey makes his case, with that type himself. The advent of an interglacial period with drought in Africa and Arabia and relative warmth in Europe would help the spread of the

Chellean-Acheulian culture-series to Europe, but would probably give it a set-back in the Arabo-African zone. At this time, also, there were considerable geological changes going on in Kenya, no doubt creating further difficulties. The return of glacial conditions in Europe and of moister climate in Africa and Arabia may have been that which gave the arts the new impetus that is commonly known as the Aurignacian or, in places, the Capsian culture.

Another line of thought may be mentioned. Some features are common to most or all varieties of *Homo sapiens* known in living examples, though no one can say how far these characters differ from those of Neanderthal man or of other early breeds, unless they relate purely to the skeleton.

Our bodies produce, by digestion and by breakdown of muscle, a large amount of heat that, in the first place, maintains an internal temperature kept constant by a complex system of controls. The amount produced is, however, normally largely in excess of what is required for this purpose; and the surplus must be dispersed mainly by evaporation and radiation. Effective but not excessive dispersal of heat is one of the prime conditions of health and well-being for all mankind. Now, so far as observations have gone, mankind in general finds that the process of heat-dispersal goes on most adequately, and yet without danger of excess, when the temperature of the atmosphere is a little over 60° F.; that is, when there is a difference of 34° to 38° between it and the temperature of the blood. There are indications that the optimum is not exactly the same for all the functions of the body; some seem to become more active with a rather lower temperature, and, for example, it is often said that a bright cold spell braces the nervous system provided the subject is well-fed and warmed.

The West Coast of Africa presents difficulties in this respect to both indigenous peoples and Europeans. It is very difficult to get rid of the heat the body produces because the atmospheric temperature is too high, and the air is so moist as to diminish evaporation. The west African shows a number of specialisations to meet these difficulties, and, from the fact that he is more comfortable in a more moderate temperature, we may draw confirmation of the view based on archaeological study generally that *Homo sapiens* did not originate in a hot moist climate. We infer, on the other hand, that he did originate in
a temperate climate, and can urge that the adjustment to a temperature-difference of 35° or so is a general constitutional feature and a very fundamental one. This view at least supports the general position set forth in this lecture and upheld for a number of years by the present writer, that the now arid zone called here the Arabo-African in a moister more temperate phase was probably an, if not the, important early home of Homo sapiens. It is worth adding the thought that this makes Homo sapiens a creature of grasslands, and so helps one to picture his dissociation from the trees and his progress towards the fully erect posture and other features that characterise our race.