reflection, we can only know *of* them by their effects on the chain of presentation. The reason for this is that feeling is not presentation, and "what is not presented cannot be re-presented." "How can that which was not originally a cognition become such by being reproduced?"

It cannot. But do we need to identify the known with knowing, in order that it may be known? Must feeling be made into a cognition to be cognized? It is obvious enough that no feeling can be revived into a re-presentation of itself, but no more can any cognition or any mental activity. Revival or recurrence of consciousness can never constitute consciousness of consciousness which is an order apart. If cognition is only presentation and re-presentation of objects, we can never attain any apprehension of consciousness, any cognition of a cognition or of a feeling or of a volition, for they are all equally in this sense subjective acts. Re presentation at any degree is never by itself sense of re-presentation or knowledge of the presentation.

Of course, the doctrine of relativity applies to introspection as to all cognition, and subject *qua* subject is as unknowable as object *qua* object. We do not know feeling in itself, nor anything else in itself, the subjective like the objective *ding an sich* is beyond our ken. Yet kinds of consciousness are as directly apprehended and discriminated as kinds of things, but the knowing is, as such, distinct from the known even when knowing is known. Here the act knowing is not the act known and is different in value. The object known is not, at least from the purely psychological point of view, ever to be confounded with the knowing, to be incorporated into cognition by virtue of being cognized. Feeling, then, seems to be as directly known by introspection and reflection as any other process. It is not a hypothetical cause brought in by the intellect to explain certain mental phenomena, but it is as distinctly and directly apprehended as cognition or volition.

The distinction between having a feeling and knowing a feeling is a very real one, though common phraseology confuses them. We say of a brave man, he never knew fear; by which we mean he never feared, never experienced fear, and not that he was ignorant of fear. Again, in like manner, we say sometimes of a very healthy person, he never knew what pain was, meaning he never felt pain. These expressions convey a truth in that they emphasize that necessity of experience in the exercise of the subjective method upon which we have already commented, but still they obscure a distinction which must be apparent to scientific analysis. We cannot know feeling except through realization, yet the knowing is not the realization. Being aware of the pain and the feeling pain are distinct acts of consciousness. All feeling, pain and pleasure, is direct consciousness, but knowledge of it is reflex, is consciousness of consciousness. The cognition of the pain as an object, a fact of consciousness, is surely a distinct act from the pain in consciousness, from the fact itself. The pain disturbance is one thing and the introspective act by which it is cognized quite another.

These two acts are not always associated though they are commonly regarded as inseparable. It is a common postulate that if you have a pain you will know it, or notice it. If we feel pained we will always know it. This seemingly true statement comes of a confounding of terms. If I have a pain I must, indeed, be aware of it, know it. in the sense that it must be in consciousness; but this makes, aware of pain, and knowing pain, such very general phrases as to equal experience of pain or having pain. But there is no knowledge in pain itself, nor pain in the knowing act *per se*. The knowing the pain must be different from the pain itself, and is not always a necessary sequent. We may experience pain without cognizing it as such. When drowsy in bed I may feel pain of my foot being "asleep," but not know it as a mental fact. We may believe, indeed, that pain often rises and subsides in consciousness without our being cognizant of it, but, of course, in the nature of the case there is no direct proof, for proof implies cognizance of fact. Pain as mental fact, an object for consciousness, not an experience in consciousness, is what is properly meant by knowing pain. Consciousness-of-pain as knowledge of it is not always involved by pain-in-consciousness as experience of it. Consciousness of pain by its double meaning as cognizance of pain and experience of pain leads easily to obscurity of thought upon this subject. But experience does not, if we may trust the general law of evolution from simple to complex, at the first contain consciousness of experience. This latter element is but gradually built up into experience, though in the end they are so permanently united in developed ego life that it is difficult to perceive their distinctness and independence.

We conclude then that while not all feelings, that is, pains and pleasures, are discovered simply by virtue of being acts of consciousness, and that not all consciousness is apperceptive of itself, yet in general feelings are known as such, and there is nothing in their nature to make them only indirectly observable by consciousness. The direct subjective method certainly presents great difficulties especially in evolutionary psychology, but still it must be accounted the only method for feeling as for all regions of psychic life.[1]

REMARKS ON AMERICAN LICHENOLOGY. — II.

BY W. W. CALKINS.

IN the *Lichens* the geographical distribution of species is quite as interesting as in phænogamia. I shall in this paper confine myself to observations and collections made in the sub-tropical section of our country. The tracing of species to their native habitats, and thence following them over often wide areas of dispersion until arrested in their progress by conditions unsuitable to their growth, is an important work for the botanist and for science. Florida — more especially its southern extremity — offers an attractive field and unusual advantages. One may draw a line east and west across the State in about latitude 25°, and below this will be found new conditions of soil, climate, and productions. A new and peculiar flora exuberant in growth will come into view. With both shores laved by the warm waters of the Gulf Stream, that "river in the ocean," also the Bahamas and Cuba less than one hundred miles distant, the reasons for the similarity of life to that of the Antillean system are plain. One has only to wander along these sunny shores and gather by bushels the proofs of what I say in such species as *Guilandina*, *Bonduc*, *Mucuna*, *Urens*, etc., that have been brought by the sea from other climes.

Then tropical Algæ claim the attention. Approximately the line I have mentioned represents two vast and dissimilar floras, each overstepping somewhat the territory of the other, but retaining the mastery in their respective fields. Here northern forms become intruders, southern less common. Many arborescent ones dwindle to shrubs. *Per contra*, further north the same law obtains. Thus hath nature set her limits. Standing on this borderland, and amazed at the change in the higher orders, I wished to know about the lower. In this field not much has been done. Our knowledge of the lichens has been until recently limited. It is my purpose to extend this knowledge somewhat, believing that it may be useful.

Most of the species described by Nylander and Tuckerman, as from Cuba and some from further south, will be found in Florida. The great order *Graphidacei*, one of the most perplexing, abounds in new species, and I am satisfied that further research will add to the number in this and other orders. I now make nearly four hundred and fifty species, which is indeed a great number for one section when we remember that only a few years ago Willey estimated that ultimately one thousand might be found on the entire continent. The final total in Florida will exceed five hundred; and I allow for some reductions which must follow their final resolution, for, as hinted in a former paper, this is more important than new species, especially if, as asserted, "species only exist in text-books,"— a proposition from which I dissent.

The following observations will only embrace a few of the rarer and little-known forms collected by me, and some others of my discovery described as new to science: *Gyalecta cubana* Nyl. On calciferous rocks, Keys of Florida, and on the main land Also in Cuba. Identified by Dr. Nylander. *Chiodecton sphærale* Nyl. A rare tropical form first found by me near Jacksonville — and

[1] For a special carrying out of the principles herein advocated see the writer's article on Primitive Consciousness in the Philosophical Review, July, 1892.

south — on *Nyssa aquatica*. *Trypethelium sprengelii* Nyl. On various barks of trees, Key West to Jacksonville. *Opegrapha diapharoides* Nyl. On oaks from Jacksonville south. The great genus *Biatora* has many species. Of these *B. carneo-albens* Nyl. and *B. Floridensis* Nyl., found by me on *Carpinus*, are new, and of tropical derivation. Two other great genera, *Arthonia* and *Graphis*, teem with new species and rare forms. These find here their greatest expression, and the latter is reduced north of Florida to a very few species.

CURRENT NOTES ON ANTHROPOLOGY.—XVI.

[*Edited by D. G. Brinton, M.D., LL.D.*]

Linguistics as a Physical Science.

WHEN one surveys the works on linguistics which have appeared in the last few years, especially such as deal with the principles of changes in languages, it is easy to classify their writers into two groups, the one preferring to explain such changes by processes of mind, the other by purely physical conditions. This distinction goes back to that which would regard linguistics as a branch of natural history, and its laws no other than purely physical ones; or, on the other hand, that which claims the changes in language come chiefly through principles of psychology, logic, and metaphysics.

Some have aimed at a compromise by saying that linguistics is in its contents a mental science, but in its methods a natural science. Professor H. Schuchardt remarks, in a late number of the *Literaturblatt für Ger. und Roman. Philologie*, that it would be just as correct to reverse this statement, or to take the position that it is half a natural and half a historical science; provided that in the latter case we understand the two members of the proposition to be successive and not contradictory, the natural element passing into the historical. "Because," he concludes, with a remarkable expression of his position, "I believe in the unity of the science, and hold that there is no greater difference between biology and linguistics than between biology and chemistry."

Gerland's Atlas of Ethnography.

I have had at hand all summer the "Atlas der Völkerkunde," by Dr. Georg Gerland, professor at the University of Strasburg (1 Vol., Gotha, Justus Perthes, 1892), and can speak of it now after that much use. It is composed of fifteen folio maps, and, as it is, I believe, the first complete ethnographic atlas ever published, it will not be out of place to give its contents. They are: I., Distribution of skin and hair; II., Density of population; III., Distribution of religions; IV., Distribution of diseases; V., Clothing, food, dwelling, and occupations; VI , Location of peoples in 1500 and 1880; VII., Europe in 1880; VIII., Asia in 1880; IX., South-east Asia; X., Oceanica; XI., Africa; XII,, Aboriginal America; XIII., America in 1880; XIV., Linguistic map; XV., Europe about 100–150 after Christ.

The first impression one has in examining the Atlas — and with me it is one that remains — is that entirely too much is attempted for a work of the size. The charts are necessarily on too small a scale and omit too much to be satisfactory for the special student; and what student is not special nowadays? The list of subjects above given will be enough to convince the reader that detail cannot be attempted in most of the charts. Turning to the map of the American aborigines, there is an evident lack of classification. For instance, what does "Peruvian peoples" mean? It is neither a linguistic nor physical group, and scarcely a political one. All tribes of Chili, Patagonia, the Pampas, and Tierra del Fuego are included under one rubric, and called "Chilians or Patagonians." Such classifications are worse than worthless, because they are misleading; and these by no means stand alone.

But it would be unfair to measure this atlas by its treatment of America, which, as usual in all works of the kind, suffers the most. In general, the Atlas is one of immense labor and of corresponding value. It ought to be in the library of every geographer and student of ethnography.

To Deduce the Stature from the Measurements of the Long Bones.

This is a problem which has occupied anatomists considerably, without leading to as uniform conclusions as one could wish. There are important ethnic variations in the length of the long bones of both extremities, as is well known, and others run in families, or are peculiar to the individual. Scott says of Rob Roy, that standing straight he could tie his garter below the knee. Such a statement makes an osteologist wish for his bones! Long fore-arms are ethnically a sign of an inferior race. Hence all proportions must to some extent be modified by considerations of race.

A general formula has lately been advanced by M. Etienne Rollet, which seems to me, after comparing it with the measurements in Topinard, Schmidt, and others, the most convenient I have seen, and sufficiently accurate. The list of coefficients is stated as follows in the *Revue Scientifique* for August: —

	Femur.	Tibia.	Fibula.	Humerus.	Radius.	Ulna.
Min.	3.66	4.53	4.58	5.06	6.86	6.41
Max.	3.71	4 61	4.66	5.22	7.16	6.66

It is enough to multiply the length of the long bone named by the coefficient given above, to obtain the height; and by taking the average of a number of such measurements we reach a figure accurate enough for the height of either sex. I say accurate enough, because there is no use in being excessively precise on this question. It is well known that there is quite a difference in our stature when we rise in the morning, and when we go to bed after a hard-day's walk.

The Birch-Tree as an Ethnic Landmark.

In a late number of the *Globus*, Dr. Krause of Kiel reviews the question of the origin of the Aryan nations as shown by the word for *birch*. The terms for birch and willow are the only two tree-names which are common, or practically so, to all tongues of the Indo-Germanic group. The ancestors of all must have come, therefore, from some locality where these trees were indigenous, and where they were of importance in the economics of the ancestral horde. The birch meant is the *Betula alba*, or white birch, and its uses in primitive conditions are numerous and familiar, as are also those of willow twigs.

All this is well known, and therefore not new. But the conclusion which has been drawn from it in favor of the derivation of the Indo-Germanic peoples from the habitat of the birch in the north of Europe is seen to be unsubstantiated, when we learn that the *Betula alba* flourishes all through Siberia, from the highlands of Afghanistan to Japan, and that two closely allied species, the *acuminata* and the *bhojpattra*. are found in various parts of the Himalayas, and in the mountains of central Asia. In Iran and on the plains of Turkestan none of these trees occurs. It would seem, therefore, that this single verbal identity does not carry us far.

To show how close the correspondences of the names of the tree are, I will quote some: English, *birch;* High German, *birke;* Hindustanee, *burj;* Sanscrit, *bhurja;* Italian, *bedoja;* Latin, *betula;* Irish, *beithe*, etc. It is a marvel to see how through unnumbered generations and over so many thousands of miles the word has retained its physiognomy.

Slavic Archæology.

Dr. Lubor Niederle is privat-docent in the branches of anthropology and pre-historic archæology at the University of Prague. That city is quite decidedly Check or Slavic, and much of the instruction is carried on in the Bohemian dialect of that tongue. In it, also, Dr. Niederle publishes his works, the last of which treats of pre-historic man in Europe with especial reference to the archæology of the Slavic countries. The title is "Lidstvo v Době Prědhistorické." It is to be hoped that of a portion of it he will prepare an abstract in French or German, as the Bohemian is a dialect with which most scientists are not familiar. The importance of such an abstract is the greater because many Slavic observers, especially local archæologists, have in late years taken