ATOMIC NO. 89.

ACTINIUM

This element shows relations with more than one of the preceding elements both of its own and other groups. It has two types of funnels, and adds eight spikes, directed to the corners of the cube.

Actinium is a true element and not the temporary product of a heavier element. It is itself radioactive.

Central globe. The globe is identical with that of Tantalum, Lu819. Fig. 88.

Funnels:

Type A. These funnels are very similar to those of Lanthanum. They contain the whole of the Lanthanum A type funnel, with the addition of two Ca45 groups. Fig. 89.

Type B. For these three funnels Actinium has borrowed from Antimony and Zirconium. They contain the large ovoid from the arm of Zirconium, Zr212, which we shall describe later when we come to discuss that element. In addition to the Zr212, the funnel contains two groups from Antimony, Sb128, and Sb113 plus three extra Anu making up Ac116. Fig. 90.

Spikes. There are eight spikes, each consisting of Li63.

Actinium = Lu819+3 [N63+N110+Mo46+Ca160+Yt44+Nb60]
+3[Zr212+Sb128+Ac116]
+8Li63

Central globe	=	819	Anu
3 funnels A of 483 Anu	=	1449	„
3 funnels B of 456 Anu	=	1368	„
8 spikes of 63 Anu	=	504	„
Total	=	4140	Anu

Number weight $\frac{4140}{18} = 230.0$

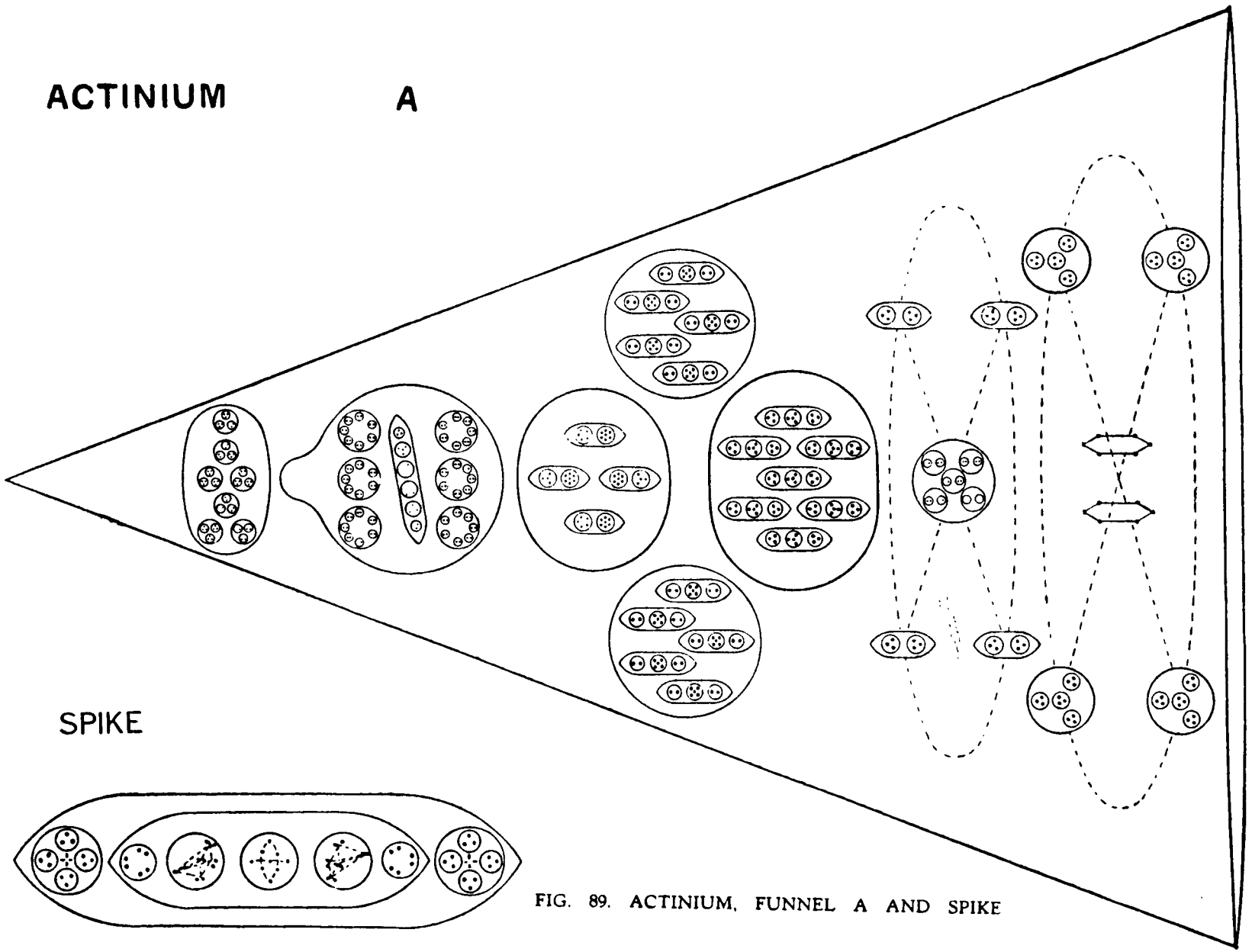


FIG. 89. ACTINIUM, FUNNEL A AND SPIKE

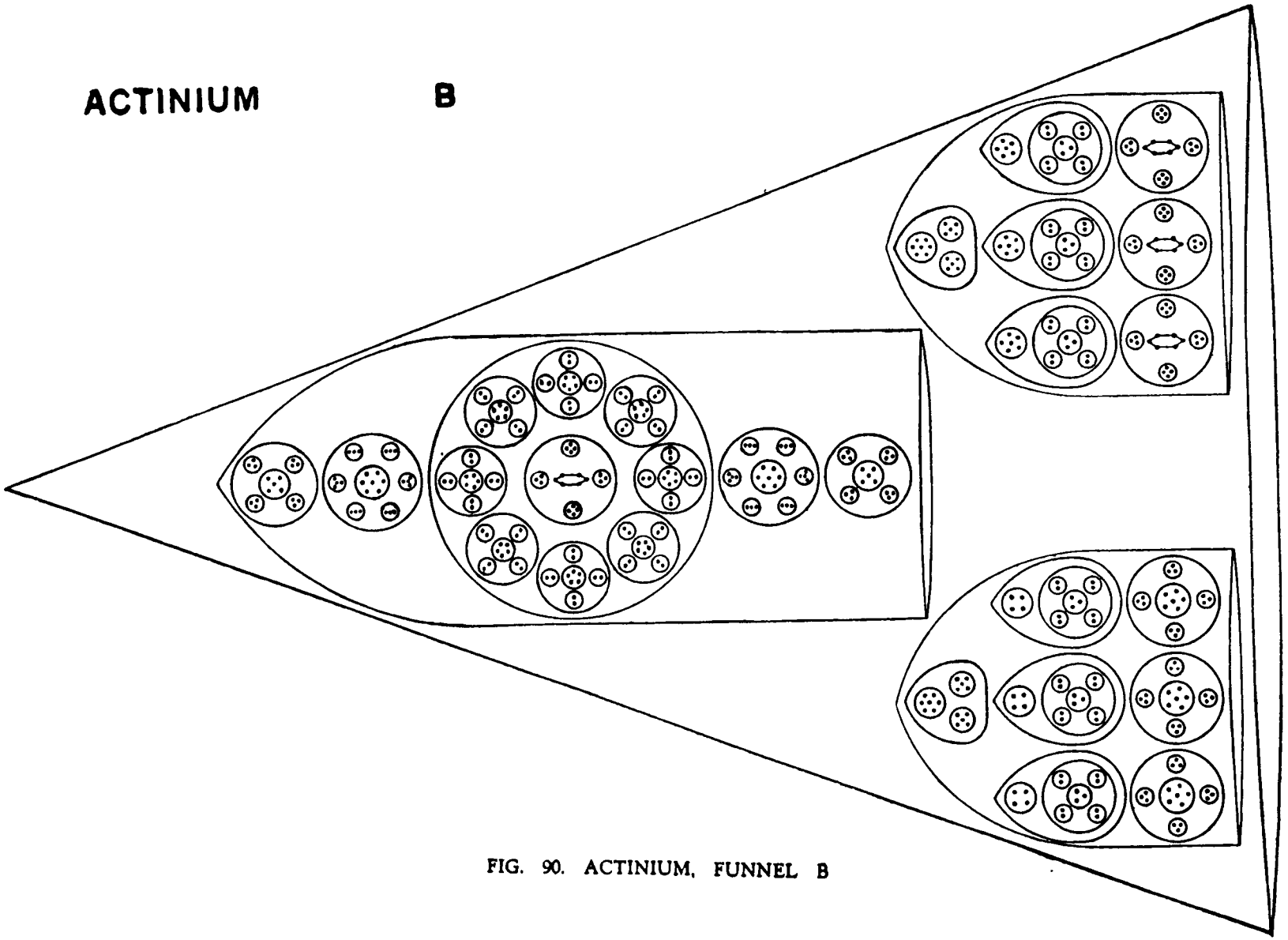


FIG. 90. ACTINIUM, FUNNEL B

ATOMIC NO. 91. PROTO-ACTINIUM

This element is very similar to Actinium. It contains two types of funnels and eight spikes.

Central globe. The globe is the familiar Lu819. Fig. 91.

Funnels:

Type A. These three funnels are exactly like the A type funnels in Actinium and contain 483 Anu. Fig. 92.

Type B. These three funnels contain the whole of the Actinium B funnels, Ac456, with the addition of a new group Pa29. Pa29 contains four Ad6 and a B5, the Ad6 being in a ring as shown. Fig. 93.

Spikes. The eight spikes are the Li63 groups as in Actinium.

Proto-Actinium = Lu819+3[N63+N110+Mo46+Ca160+Yt44+Nb60]
+3[Zr212+Sb128+Ac116+Pa29]
+8Li63

Central globe	=	819	Anu
3 funnels A of 483 Anu	=	1449	„
3 funnels B of 485 Anu	=	1455	„
8 spikes of 63 Anu	=	504	„
Total	=	4227	Anu

Number weight $\frac{4227}{18} = 233.72$

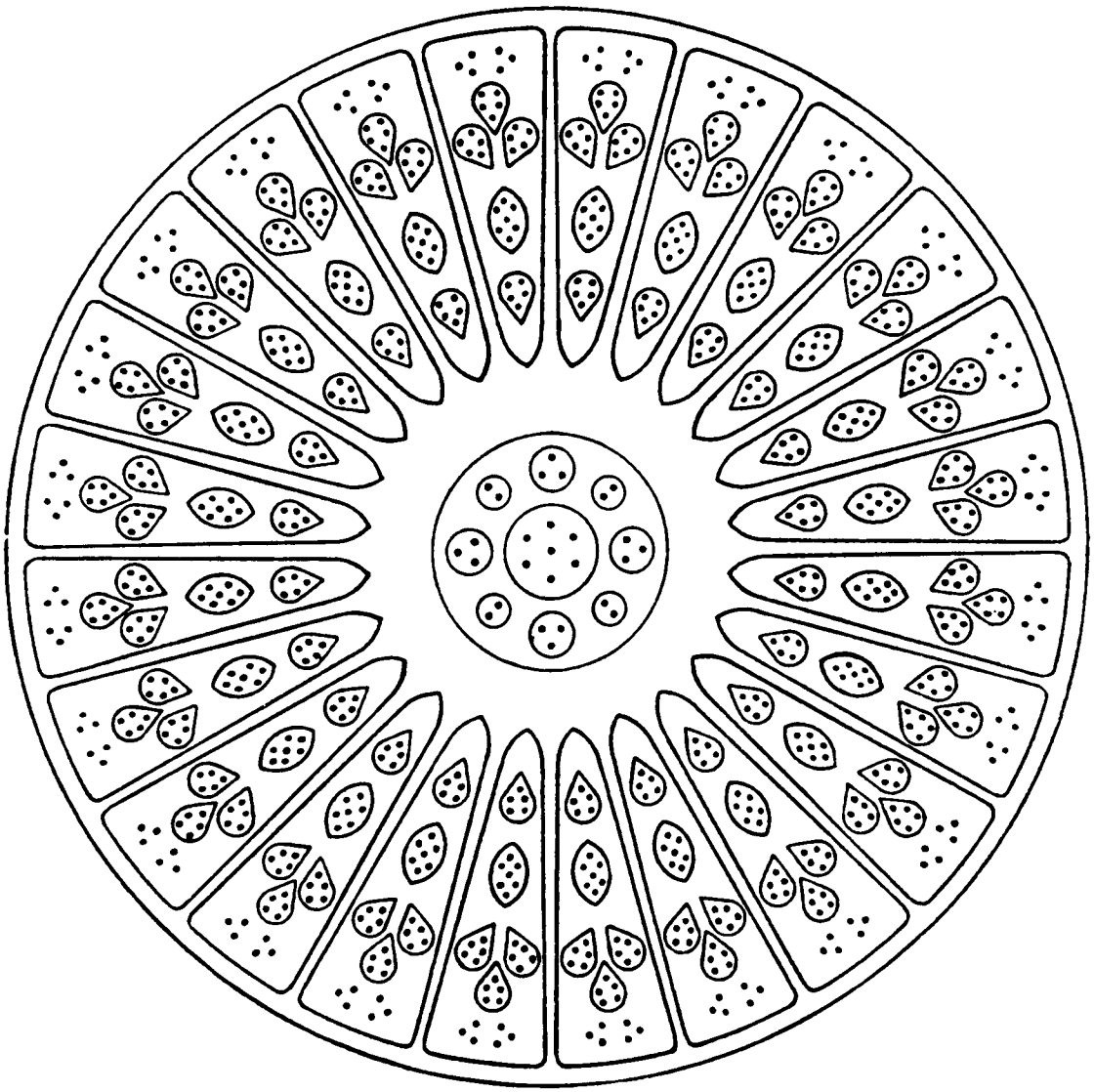


FIG. 91. CENTRE OF PROTO-ACTINIUM, Lu819

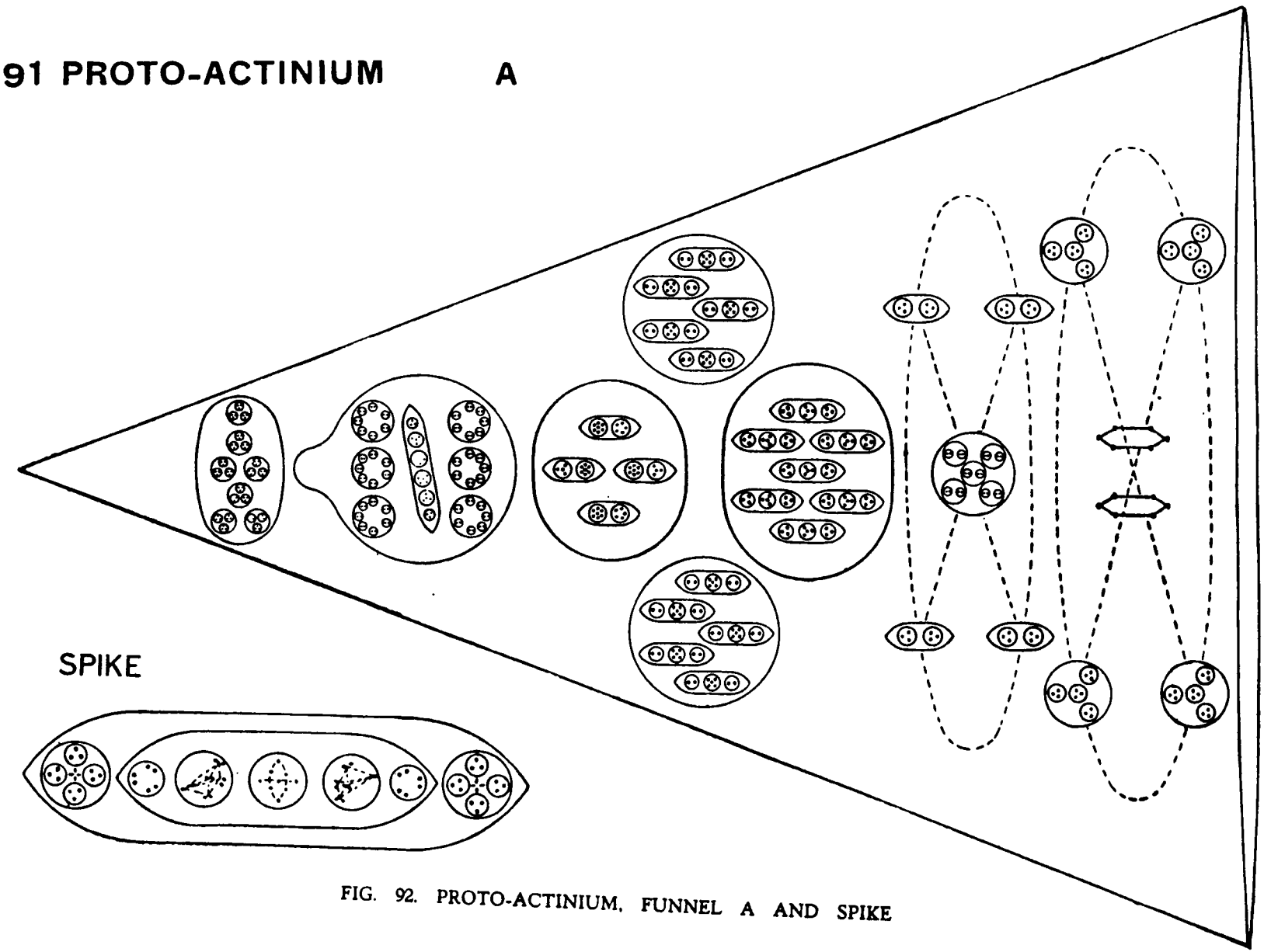


FIG. 92. PROTO-ACTINIUM, FUNNEL A AND SPIKE

91 PROTO-ACTINIUM B

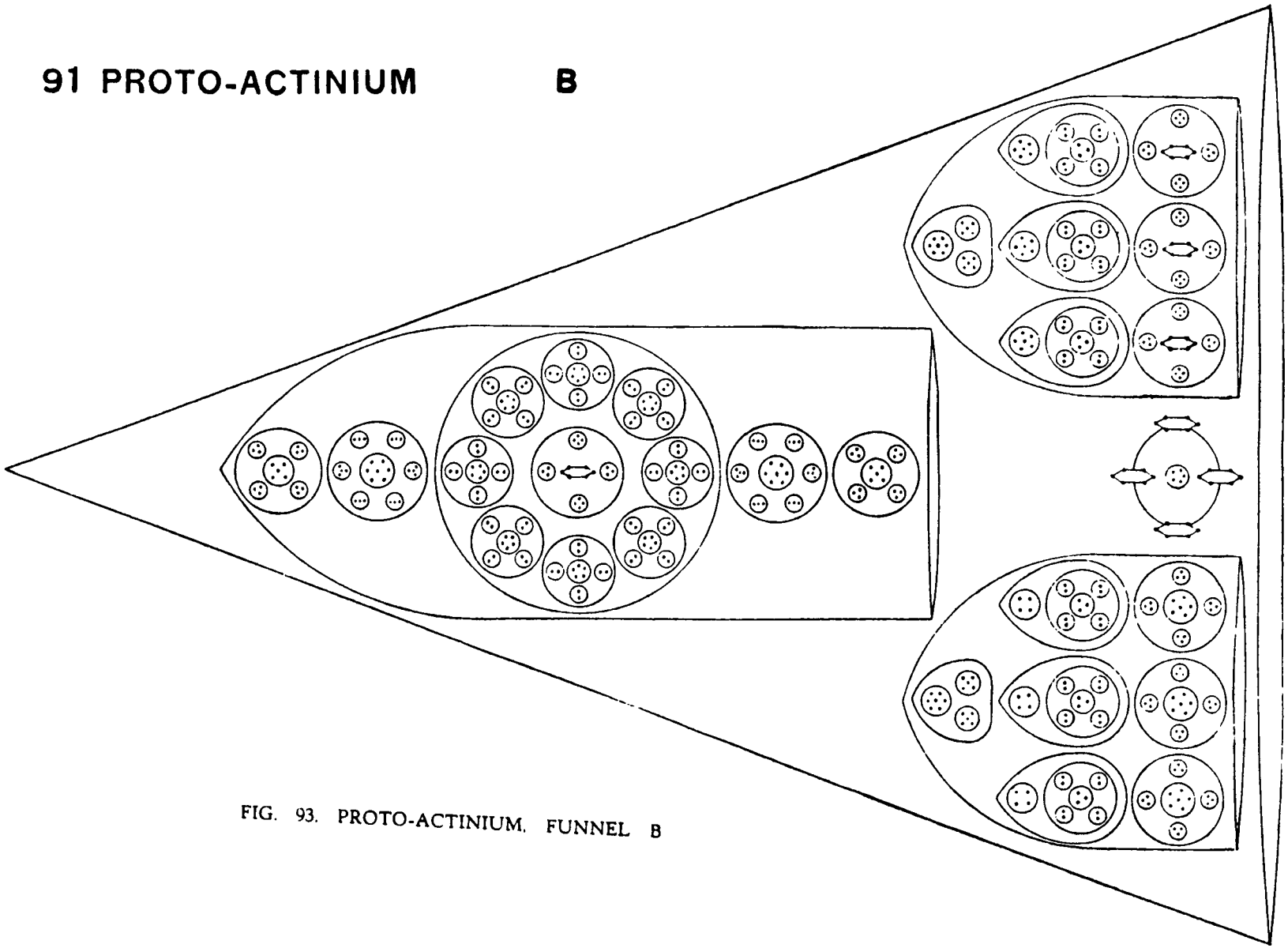


FIG. 93. PROTO-ACTINIUM. FUNNEL B

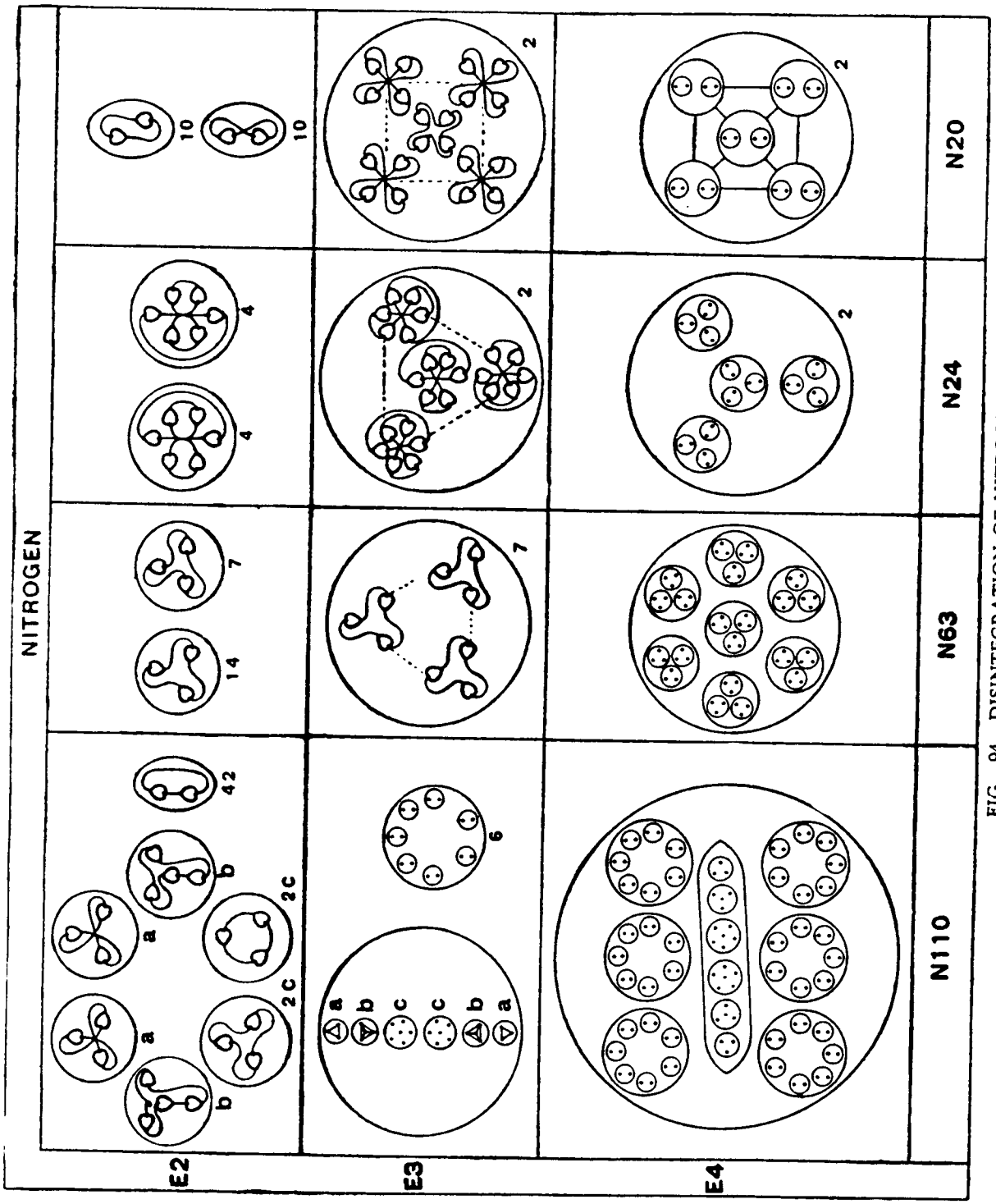


FIG. 94. DISINTEGRATION OF NITROGEN

DISINTEGRATION OF CUBE GROUP A

DISINTEGRATION OF NITROGEN

The constituents of Nitrogen are used constantly in this and other groups.

Nitrogen consists of six bodies, N110, N63, two N24 and two N20, each of these being complex. Fig. 94.

N110. The "balloon," N110, changes to a sphere, and holds together on the E4 level; on the E3 it yields six globes each containing seven duads, and these are all set free as duads on the E2 level. The ovoid is also set free on the E3 level, becoming a sphere; and on the E2 level it liberates its contained bodies, as two triplets, two quartets and two sextets which immediately become triplets.

N63. This body is liberated on the E4 level. On the E3 level it sets free seven bodies of 9 Anu and these become twenty-one triplets on the E2 level.

N24. The two N24 spheres are liberated on the E4 level. On the E3 level each assumes a tetrahedral form with six Anu at each point. On the E2 level each gives four sextets.

N20. On the E4 level each N20 is found as a tetrahedral arrangement of pairs of duads at the angles of a square-based pyramid.

On the E3 we find a similar arrangement though the distribution of the forces is changed. On the E2 level the groups separate into 10 duads from each N20.

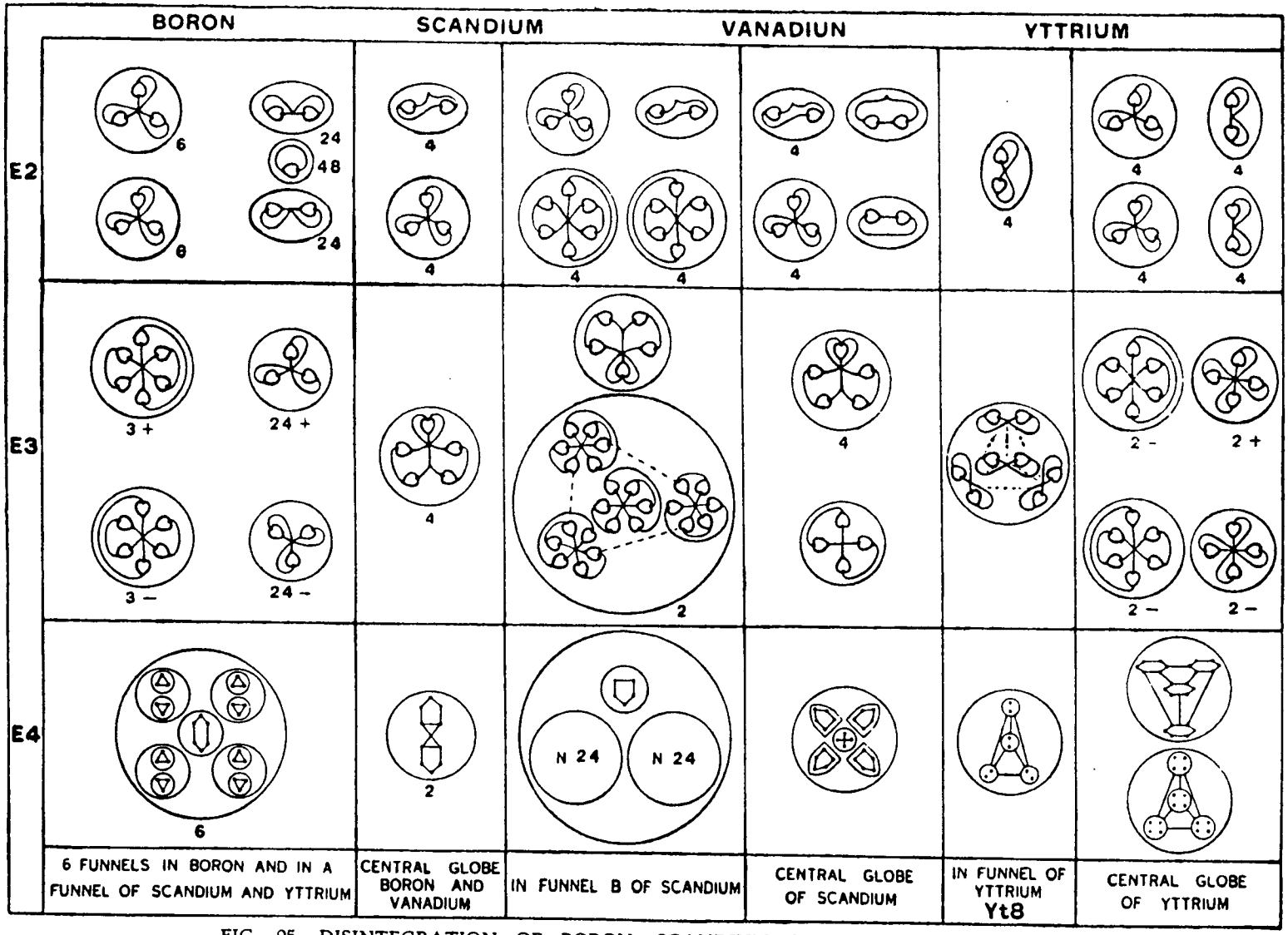


FIG. 95. DISINTEGRATION OF BORON, SCANDIUM, VANADIUM, YTTRIUM

DISINTEGRATION OF BORON

The Central globe, with its four quintets, is set free and breaks at once into two groups of ten Anu. Fig. 95.

On the E3 level four quintets are formed which, on the E2 level, are resolved into triplets and duads.

The funnels. The six funnels are first set free on the E4 level, where they assume the spherical form, showing a central Ad6 and four globes each containing two triplets.

On the E3 level the Ad6 behaves as usual and the triplets separate. On the E2 level the Ad6 gives triplets and the other triplets give duads and units.

DISINTEGRATION OF SCANDIUM

The Central globe shows a cross at its centre, with the four quintets whirling round it, on the E4 level. On the E3 level the quintets are set free and follow the Boron type, while the cross becomes a quartet. On the E2 level each quintet gives a triplet and a duad and the quartet two duads. Fig. 95.

Funnels A. In funnels A the Ad6 and the ovoids behave as in Boron, but the N110 escapes from the funnel as it changes to a sphere and holds together on the E4 level. The N110 disintegrates as shown under Nitrogen and the rest of the funnel as in Boron.

Funnels B. The N63 escapes when the funnel becomes a sphere on the E4 level. The remaining sphere contains the two N24 and the quintet B5. On the E3 and E2 levels these groups behave as in Nitrogen and Boron.

DISINTEGRATION OF VANADIUM

The Central globe follows the pattern of the globe of Boron. Fig. 95. The centre sphere I.7 is shown in Iodine.

The A funnels of Vanadium repeat the A funnels of Scandium with the addition of N20. All these disintegrate as shown under Nitrogen or Boron.

The B funnels also repeat the B funnels of Scandium with the addition of a N20 group and the substitution of a sextet, N6, for a quintet. These also disintegrate as shown under previous elements.

DISINTEGRATION OF YTTRIUM

The Central globe breaks up into two groups which disintegrate as shown in Fig. 95.

Funnels. On the E4 level the six funnels are first liberated and then the N110 and N63 escape and behave as shown in Nitrogen. The ovoids, 2H3, and the cigars, Ad6, are set free on the E3 level and behave as in Boron Fig. 95.

Yt8 is a tetrahedral arrangement of duads on the E3 level and these are set free as duads on the E2 level. The N20 behaves as shown under Nitrogen.

Fig. 96 shows the Cube Group A in a condensed form, from which the relationships in the group may be studied.

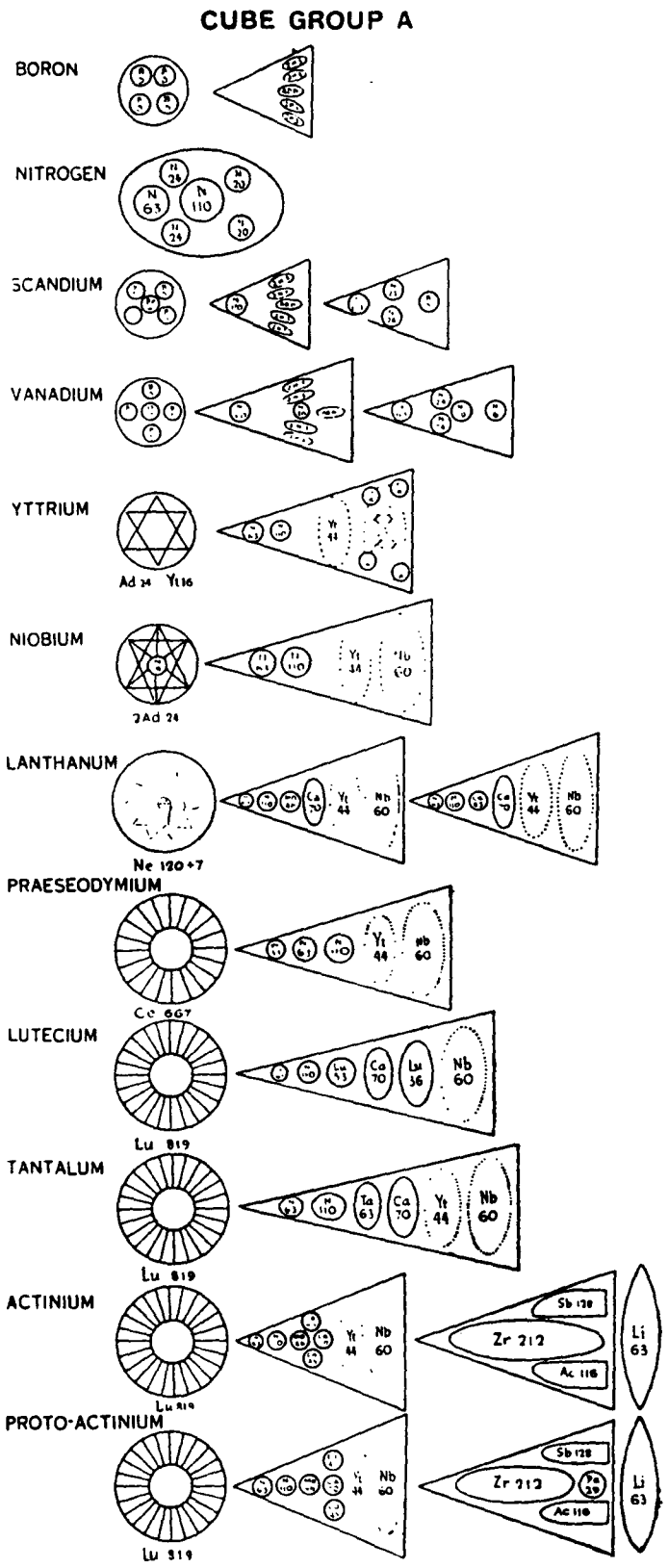


FIG. 96. CUBE GROUP A

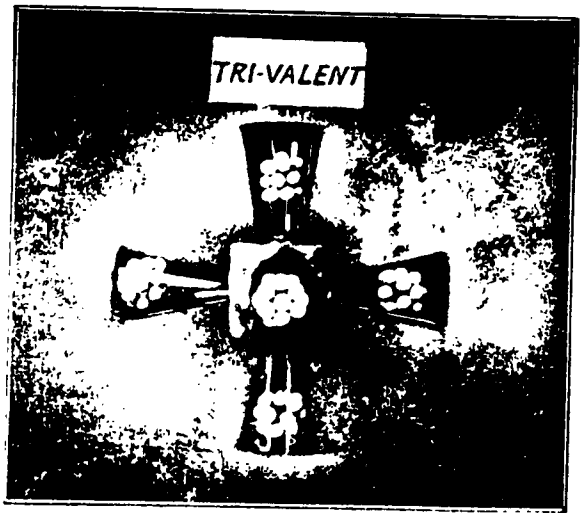


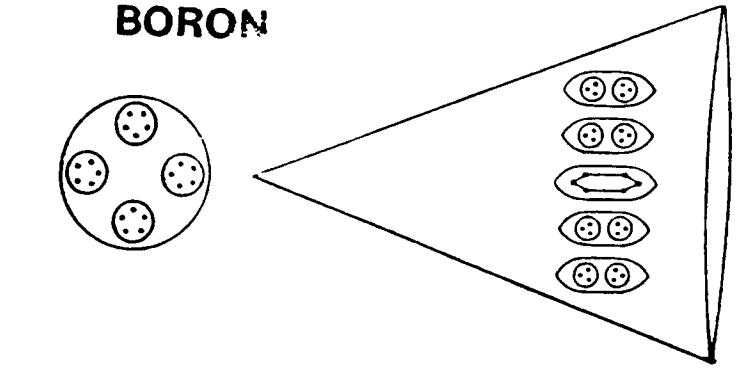
FIG 7b TYPES OF THE CUBE GROUP

CHAPTER VII

THE CUBE GROUP A

ALL the members of this group, with the exception of Nitrogen, have the external form of a cube. Fig. 76. They occur on the left hand swing of the pendulum. Their characteristic valence is three, but higher valencies are developed. They all have six funnels opening on the six faces of a cube, and in two cases there are also spikes pointing to the eight corners of the cube. At first sight it would appear that Nitrogen should not be placed in this group but, as we shall see, the constituents of Nitrogen occur constantly in the components making up the funnels of the elements in this group.

ATOMIC NO.	ANU	ELEMENT	CENTRE	6 FUNNELS
5	200	Boron	(4 B5)	6 [4 (2H3) + Ad6]
7	261	Nitrogen	(N110 + N63 + 2N24 + 2N20)	
21	792	Scandium	(4 B5 + Be4)	3 [N110 + 4 (2H3) + Ad6] 3 [N63 + 2N24 + B5]
23	918	Vanadium	(4 B5 + I.7)	3 [N110 + N20 + 4 (2H3) + Ad6] 3 [N63 + 2N24 + N20 + N6]
39	1,606	Yttrium	(Ad24 + Yt16)	6 [N63 + N110 + Yt44 + (4Yt8 + 2Ad6)]
41	1,719	Niobium	(2Ad24 + N9)	6 [N63 + N110 + Yt44 + Nb60]
57	2,482	Lanthanum	(Ne120 + 7)	3 [N63 + N110 + Mo46 + Ca70 + Yt44 + Nb60] 3 [N63 + N110 + Ca45 + Ca70 + Yt44 + Nb60]
59	2,527	Praeseodymium	(Ce27 + 30 Ce32) = Ce667	6 [Pr33 + N63 + N110 + Yt44 + Nb60]
71	3,171	Lutecium	(Ce27 + 24Ba33) = Lu819	6 [N63 + N110 + Lu53 + Ca70 + Lu36 + Nb60]
73	3,279	Tantalum	Lu819	6 [N63 + N110 + Ta63 + Ca70 + Yt44 + Nb60]
89	4,140	Actinium	Lu819	3 [N63 + N110 + Mo46 + Ca160 + Yt44 + Nb60] 3 [Zr212 + Sb128 + Ac116] + 8 Li63
91	4,227	Proto-Actinium	Lu819	3 [N63 + N110 + Mo46 + Ca160 + Yt44 + Nb60] 3 [Zr212 + Sb128 + Ac116 + Pa29] + 8 Li63



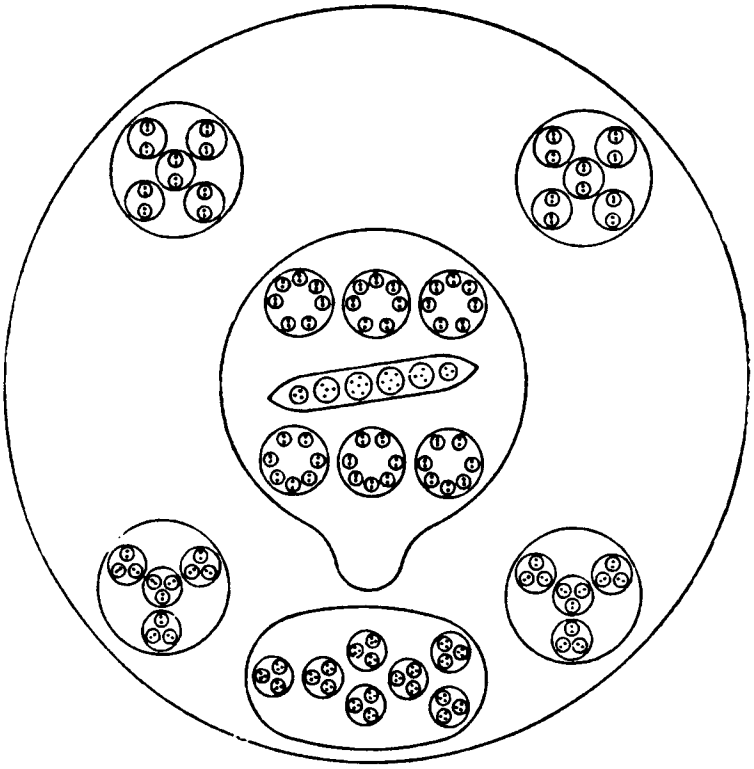


FIG. 77. BORON, NITROGEN

ATOMIC NO. 5.

BORON

In Boron we have the simplest form of the cube. Fig. 77. It is as simple in relation to the other members of its group as is Beryllium.

The Central globe has four spheres of five Anu, 4B5.

The funnels contain five bodies also, four ovoids each of 2H3, and one Ad6. All six funnels are alike.

Boron = 4B5+6 [4 (2H3)+Ad6]

Central globe	=	20	Anu
6 funnels each of 30 Anu	=	180	„
Total	=	200	Anu

Number weight $\frac{200}{18} = 11.11$

ATOMIC NO 7

NITROGEN

Nitrogen does not assume the cubic form of its relatives, but is shaped like a sphere. Fig. 77. The balloon-shaped body, N110, floats in the middle of the sphere. This N110 contains six smaller spheres in two horizontal rows, and a long ovoid in the middle. The balloon-shaped body is positive and is drawn down towards the negative body, N63, below it. N63 contains seven spheres, each of which has nine Anu within it, arranged as three triads. In addition to N110 and N63 there are four more spheres in Nitrogen. Two of these, N20, containing five smaller globes of four Anu, are positive and two, N24, containing four globes of six Anu, are negative.

What is there in Nitrogen which renders it so inert as conveniently to dilute the fiery Oxygen and make it breatheable, while it is so extraordinarily active in some of its compounds that it enters into the most powerful explosives? Some chemist of the future perhaps will find the secret in the arrangement of its constituent parts which we are able only to describe.

Nitrogen = N110+N63+2N24+2N20

Balloon	=	110	Anu
Oval	=	63	„
2N24	=	48	„
2N20	=	40	„
Total	=	261	Anu

Number weight $\frac{261}{18} = 14.50$

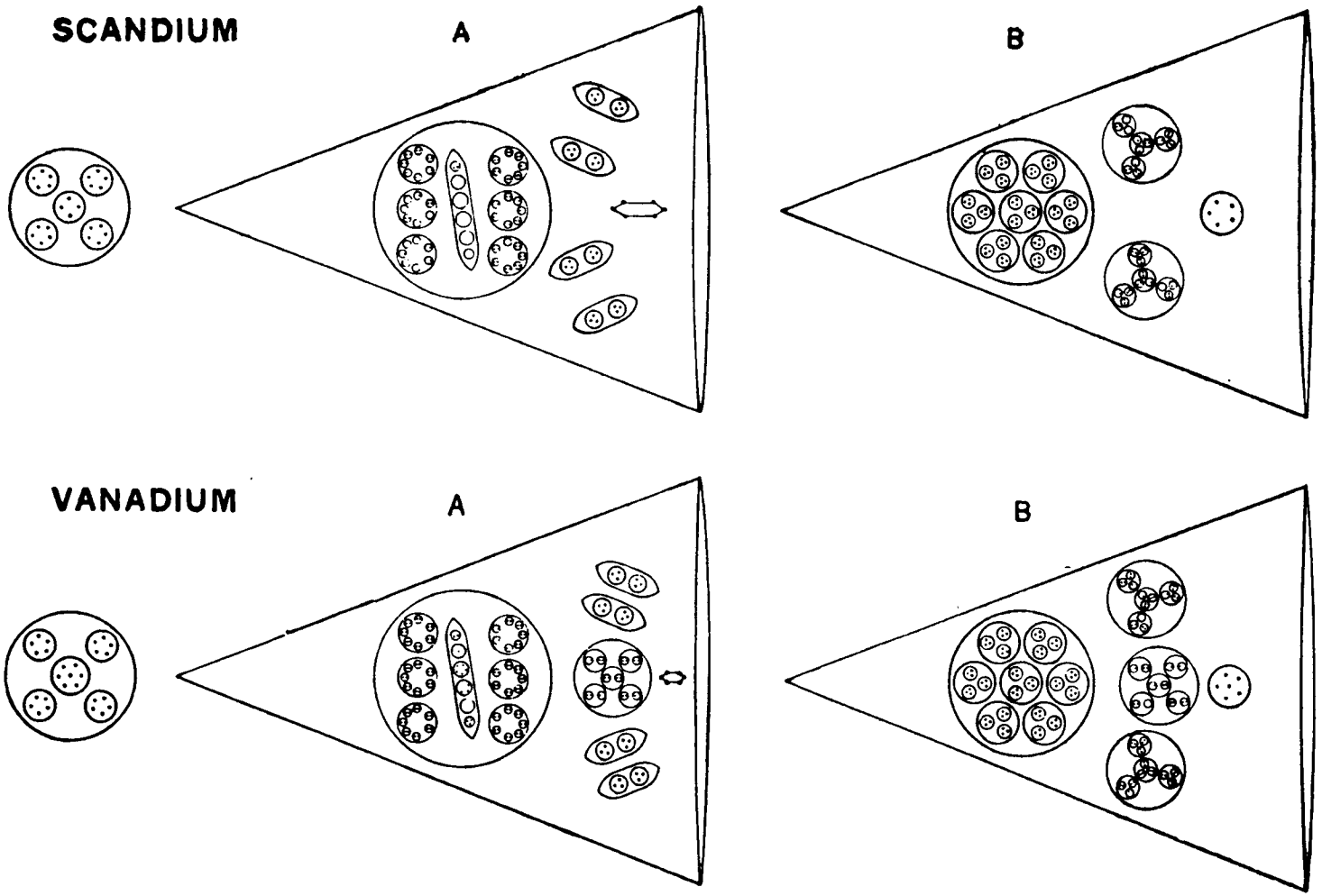


FIG. 78. SCANDIUM. VANADIUM

ATOMIC NO. 21.

SCANDIUM

In Scandium for the first time we meet funnels of two different types in the same atom. The three funnels of type A appear to be positive and those of type B negative, but this must be stated with reserve. Fig. 78.

Central globe. The central globe repeats that of Boron, with an additional sphere of four Anu in the centre.

Funnels. In the A type the Boron funnel is reproduced, the Ad6 having risen above its companion ovoids; but the most important matter to note in respect to this funnel is the introduction of the body N110. This body was observed by us first in Nitrogen, in 1895, and we gave it the name of the "nitrogen balloon," for in Nitrogen it takes the balloon form, which it also often assumes in other gaseous elements. Here it appears as a sphere, the form it always assumes on the E4 level. It will be observed that this N110 appears in every member of this group except Boron.

The B type of funnel runs largely to triads. It contains N63, which has not only a triadic arrangement of spheres within its contained globes, but each sphere has also a triplet of Anu. The funnel also contains two N24 and is completed by a sphere of five Anu at the top of the funnel.

Scandium = (4B5+Be4) +3 [N110+4 (2H3) +Ad6] +3 [N63+2N24+B5]

Central globe	=	24	Anu
3 funnels A of 140 Anu	=	420	„
3 funnels B of 116 Anu	=	348	„
Total	=	792	Anu

Number weight $\frac{792}{18}$ = 44.00

ATOMIC NO. 23.

VANADIUM

Vanadium closely follows Scandium. Fig. 78.

The central globe has seven Anu, I.7, in its central body, instead of four as in Scandium.

Funnels. The funnels of type A only differ from those of Scandium by having a globe, N20, inserted in the ring of four ovoids.

The B type funnels have a globe containing six Anu instead of five at the top, and slip in a third globe containing twenty Anu, N20, between the two N24 of Scandium.

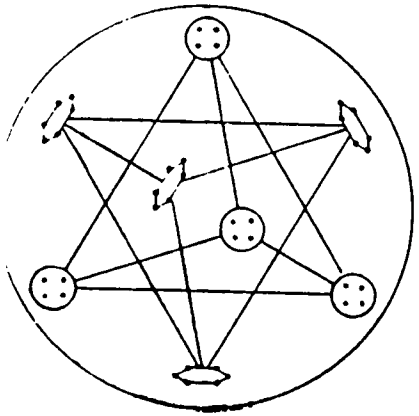
In this way Vanadium succeeds in overtopping Scandium by 126 Anu.

Vanadium = (I.7+4B5)+3 [N110+N20+4 (2H3)+Ad6] +3 [N63+2N24+N20+N6]

Central globe	=	27	Anu
3 funnels A of 160 Anu	=	480	„
3 funnels B of 137 Anu	=	411	„
Total	=	918	Anu

Number weig $\frac{918}{18}$ = 51.00

YTTRIUM



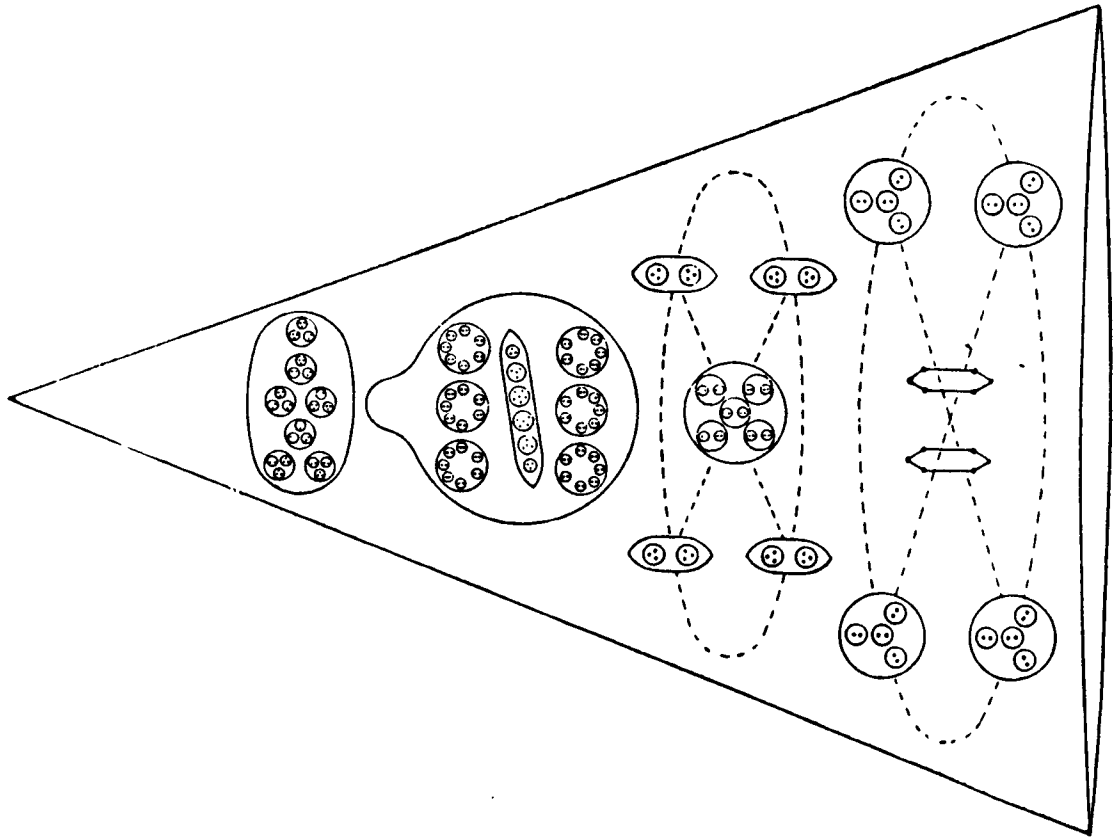


FIG. 79. YTTRIUM

ATOMIC NO. 39.

YTTRIUM

The *central globe* presents us with two tetrahedrons, recalling one of the combinations in Adyarium and in Gold, and differing from that in Gold only by the substitution of two quartets for the two triplets. Fig. 79.

Funnels. The funnels are of one type only, and we have here quite a new arrangement of bodies within the funnel. At the bottom comes N63, followed by N110. The N63 is slightly lengthened.

Two Ad6 whirl on their own axes in the centre near the top, while four globes of eight Anu chase each other in a circle round them, spinning madly on their own axes. This axial spinning seems constant in all contained bodies. Lower down in the funnel a similar arrangement is seen, with a globe, N20, replacing the two Ad6, and four ovoids of six Anu replacing the globes of eight Anu. This group is identified as Yb44.

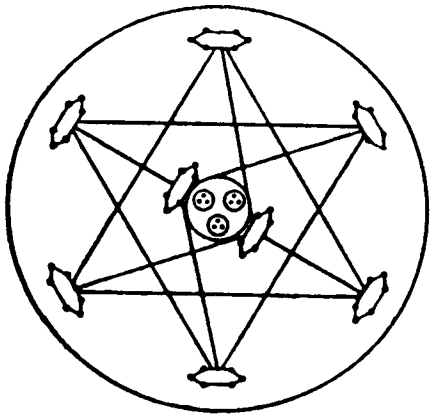
One funnel of Yttrium contains exactly the same number of Anu as is contained in a gaseous atom of Nitrogen. Further, N110, N63 and N20 are all constituents of Nitrogen. We put on record these facts, without trying to draw any conclusions from them. Some day we, or others, may find out their significance, and trace through them obscure relationships.

Yttrium = (Ad24+Yt16)+6 [N63+N110+Yt44+ (4Yt8+2Ad6])

Central globe	=	40	Anu
6 funnels of 261 Anu	=	1566	„
Total	=	1606	Anu

Number weight $\frac{1606}{18} = 89.22$

NIOBIUM



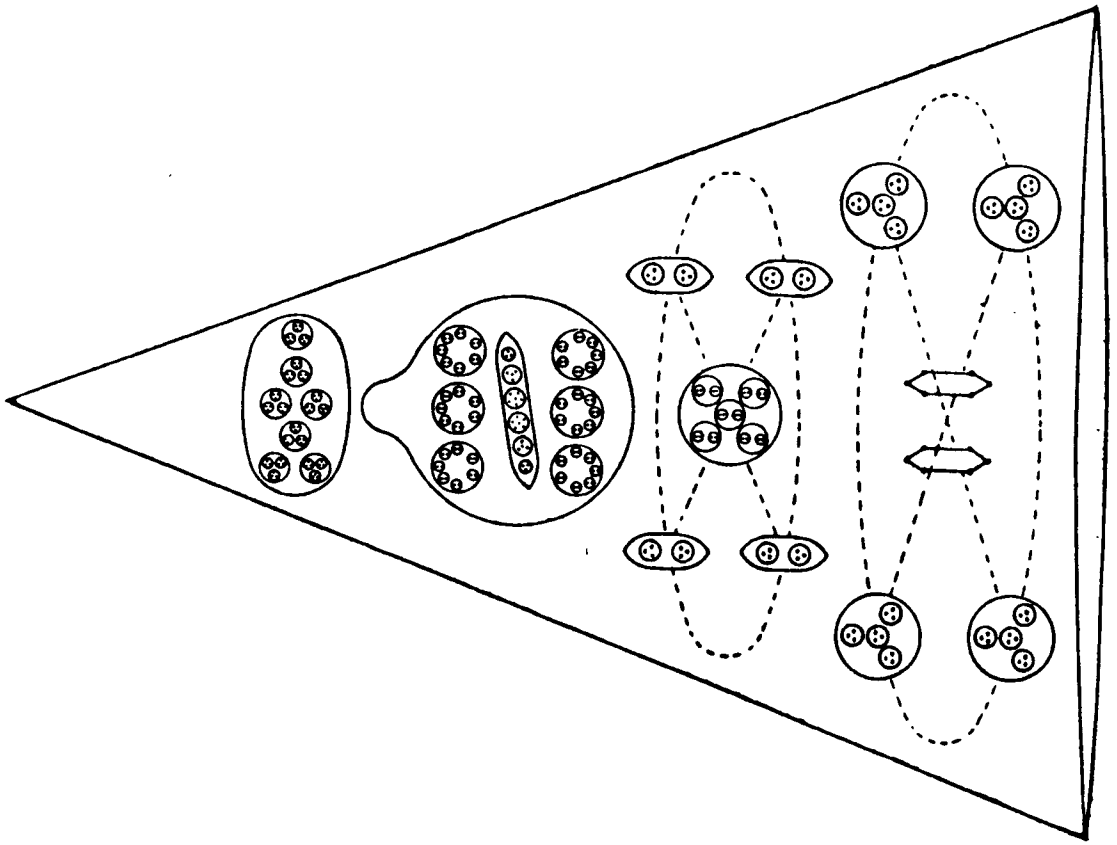


FIG. 80. NIOBIUM

ATOMIC NO. 41.

NIOBIUM

This element is as closely related to Yttrium as is Vanadium to Scandium. Fig. 80.

Central globe. In the central globe we find two interlaced tetrahedrons each of four Ad6, 2Ad24, and a central sphere of nine Anu, N9, spinning round in the centre, seventeen Anu being thus added in each globe.

Funnels. Niobium contains only one type of funnel, and these are exactly like those of Yttrium, save that the little globes which scamper round the two Ad6 contain twelve Anu instead of eight. Thus each funnel contains N63, N110, Yt44 and the new group which is identified as Nb60.

Niobium = (2Ad24 + N9) + 6 (N63 + N110 + Yt44 + Nb60)

Central globe	=	57	Anu
6 funnels of 277 Anu	=	1662	„
Total	=	1719	Anu

Number weight $\frac{1719}{18} = 95.50$

ATOMIC NO 57

LANTHANUM

This element is closely related to Vanadium and Niobium. It also uses two of the forms belonging to the Calcium group, which have apparently been brought over from its predecessor in atomic weight, Barium, by the evolutionary force. Figs. 81, 82.

Central globe. The central globe is formed from a very striking group which occurs very often. It is made of five interpenetrating tetrahedrons, each tetrahedron being formed of four Ad6, making the group Ad24. The group of five of these tetrahedrons occurs first in Neon and has been called Ne120. In Lanthanum there is a small sphere of seven Anu, I.7, at the centre of the Ne120.

Funnels. As in Vanadium we find here two types of funnels.

Type A. These three funnels contain six groups, that nearest the centre being N63. Next we find N110, and then two groups from the Calcium type, Mo46 and Ca70. Then comes the group Yt44, and finally the large group Nb60.

Type B. These three funnels differ from those of the A type only in having a group Ca45 instead of the Mo46.

Lanthanum = (Ne120 + I.7) + 3 [N63 + N110 + Mo46 + Ca70 + Yt44 + Nb60]
+ 3 [N63 + N110 + Ca45 + Ca70 + Yt44 + Nb60]

Central globe	=	127	Anu
3 funnels A of 393 Anu	=	1179	„
3 funnels B of 392 „	=	1176	„
Total	=	2482	Anu

Number weight $\frac{2482}{18} = 137.9$

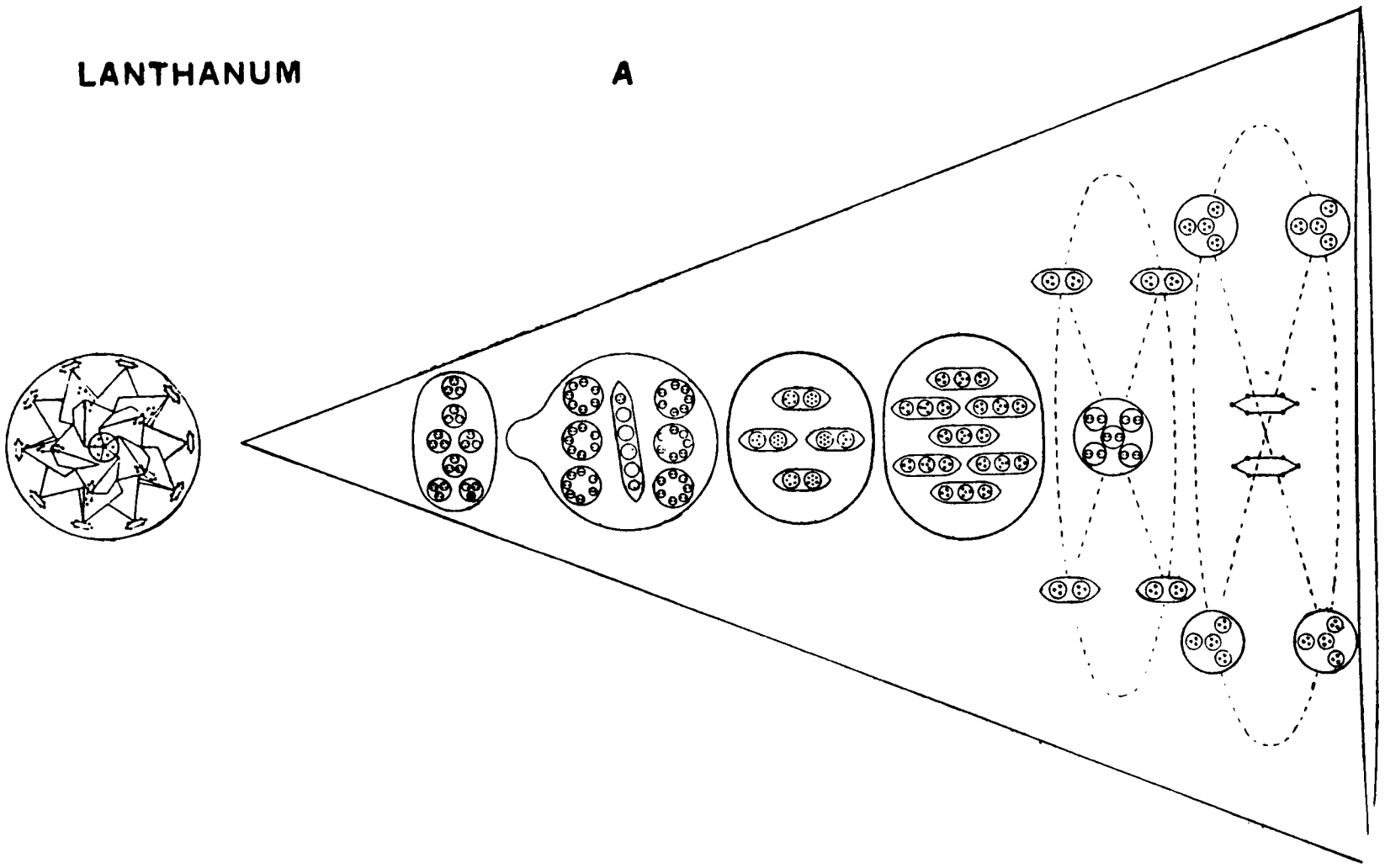


FIG. 81. LANTHANUM CENTRE AND FUNNEL A

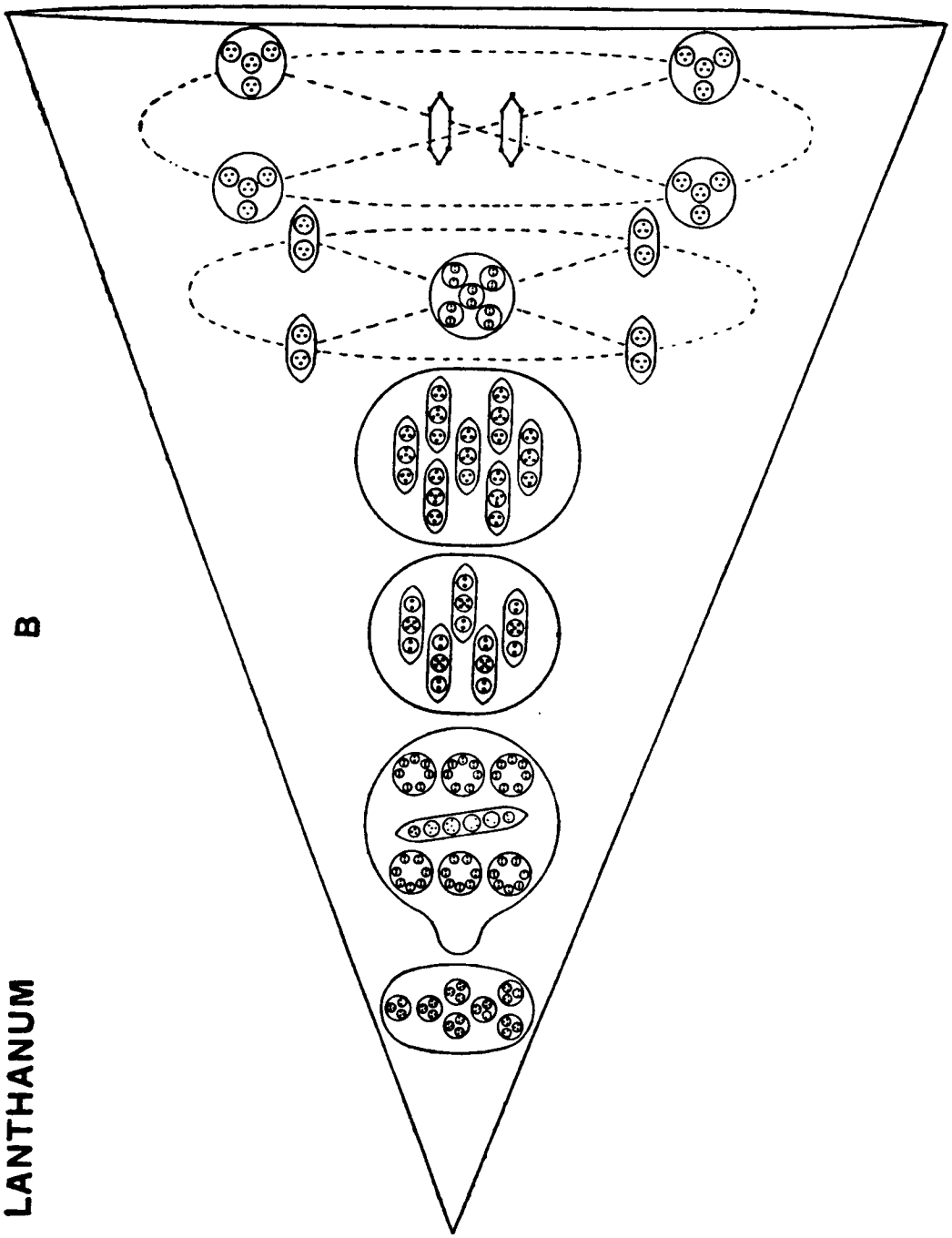


FIG. 82. LANTHANUM, FUNNEL B

PRAESEODYMIUM

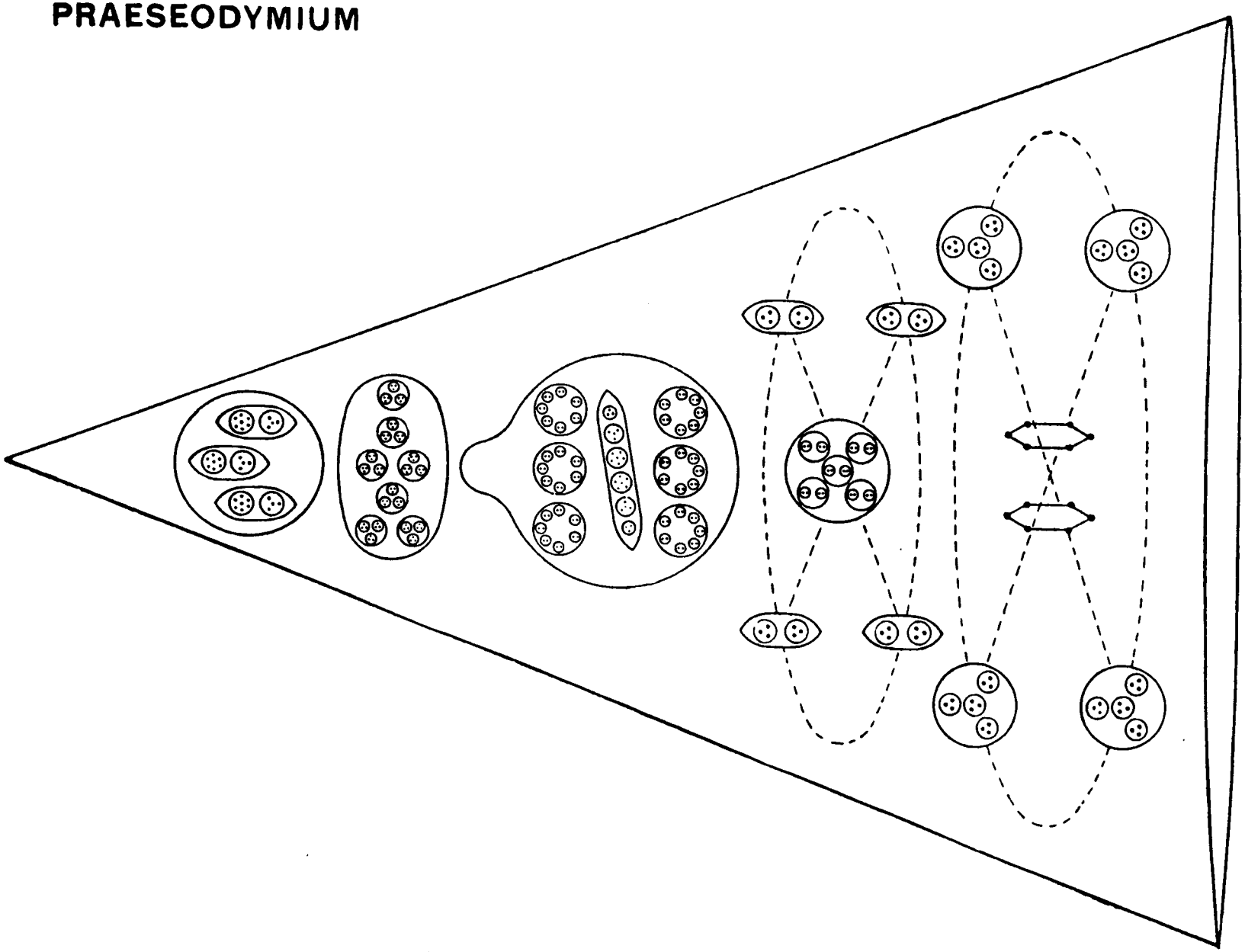


FIG. 83. PRAESEODYMIUM: FUNNEL

ATOMIC NO. 59. PRAESEODYMIUM

Central globe. The Central globe, Fig. 84, is complex and is borrowed from Cerium, its predecessor in the atomic weight list. It consists of a centre-piece of 27 Anu, Ce27, and then a ring of twenty segments, each containing 32 Anu. Thus the central globe is identical with Ce667. It also occurs in Neodymium.

Funnels. Praeseodymium has six similar funnels. Fig. 83. At the bottom of the funnel comes a group containing three ovoids, Mo11, making Pr33, and then the N63 and N110 groups. Next comes the Yt44, and finally Nb60.

Praeseodymium = Ce667+6[Pr33+N63+N110+Yt44+Nb60]

Central globe	=	667	Anu
Six funnels of 310 Anu	=	1860	„
Total	=	2527	Anu

Number weight $\frac{2527}{18}$ = 140.4

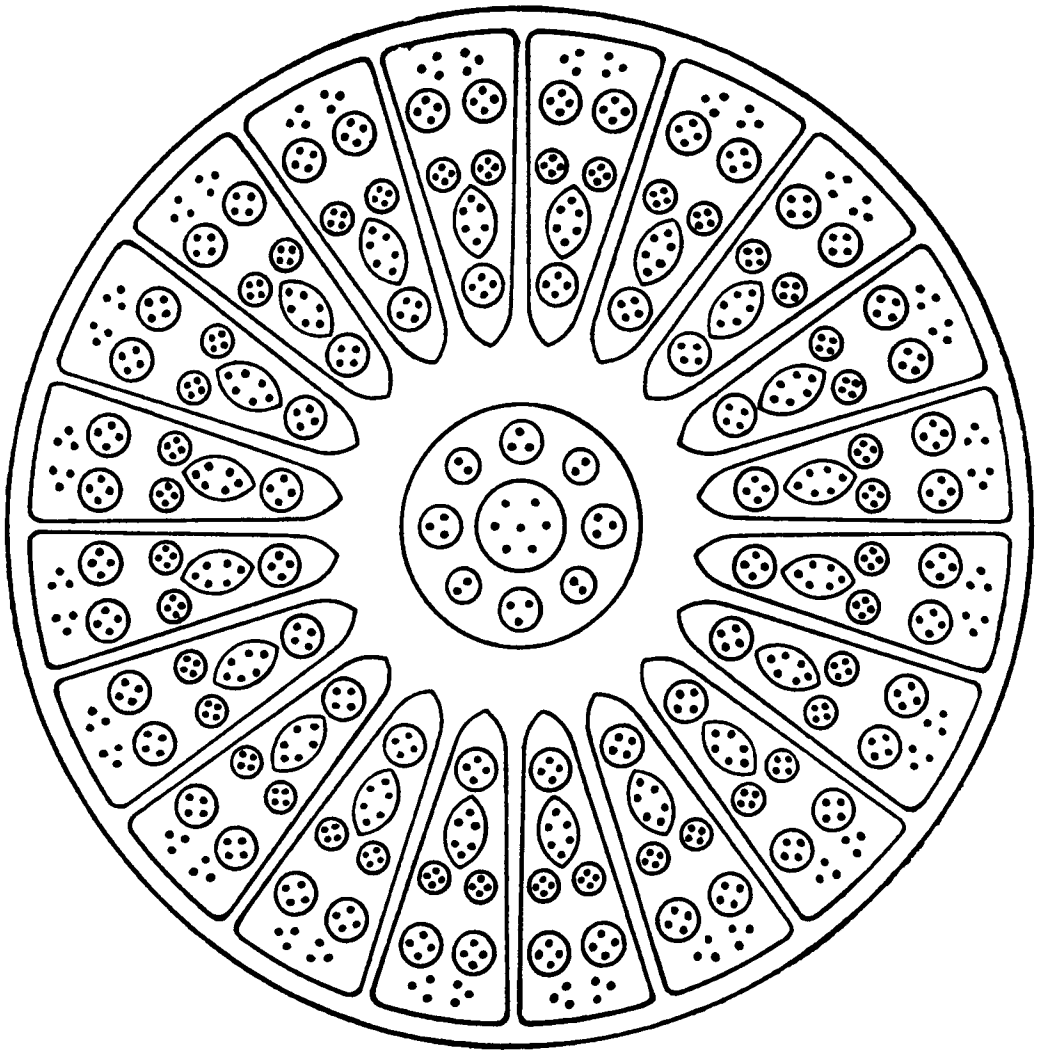


FIG. 84. PRAESEODYMIUM CENTRE, Ce667

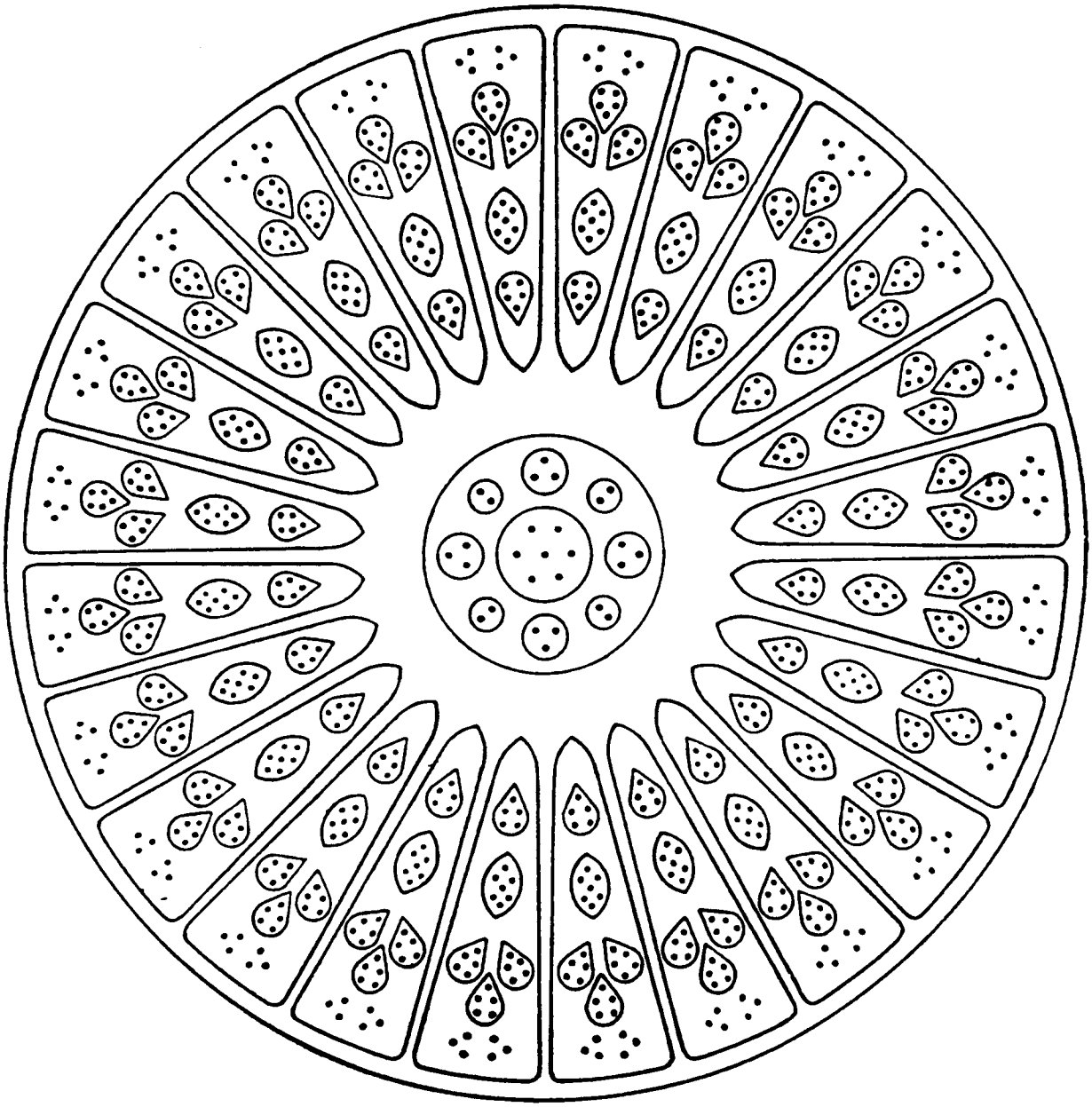


FIG. 85. LUTECIUM CENTRE, Lu819

LUTECIUM

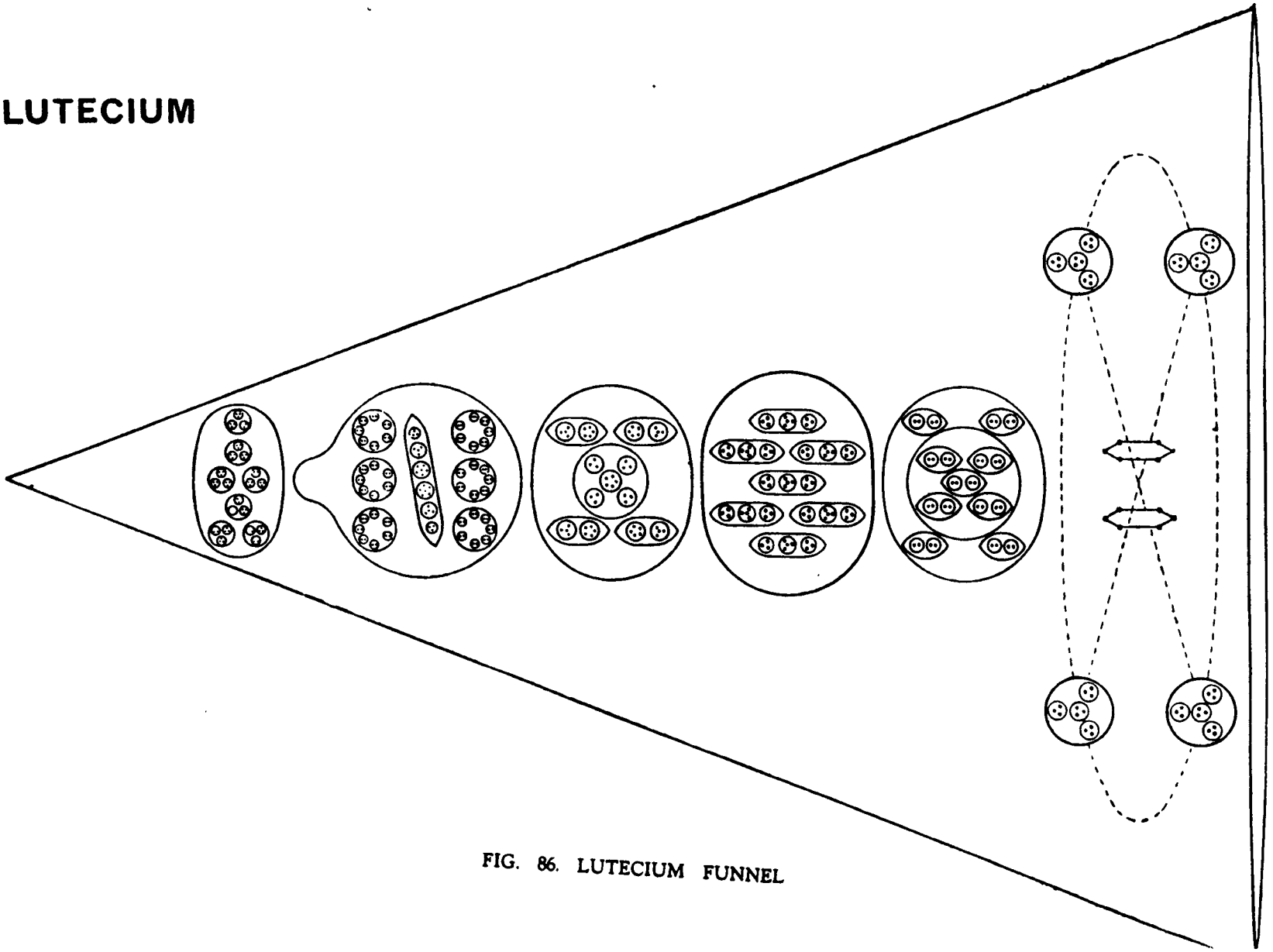


FIG. 86. LUTECIUM FUNNEL

ATOMIC NO. 71.

LUTECIUM

Central globe. In this element occurs the remarkable central globe containing 819 Anu which is found in Radium and other elements. As Lutecium is the element of lowest atomic weight in which this globe occurs it has been identified as Lu819. The globe is formed of a grand centre of 27 Anu surrounded by 24 segments of the Ba33 form, making up the 819 Anu. Fig. 85.

Funnels. Lutecium has six similar funnels. At the bottom of the funnel we find first N63, then N110, and then a group Lu53. Next comes Ca70 and then another new group Lu36 instead of the usual Yt44, and finally the familiar Nb60. Fig. 86.

Lutecium = Lu819+6 [N63+N110+Lu53+Ca70+Lu36+Nb60]

Central globe .	=	819	Anu
6 funnels of 392 Anu	=	2352	„
Total	=	3171	Anu

Number weight $\frac{3171}{18} = 176.17$

TANTALUM

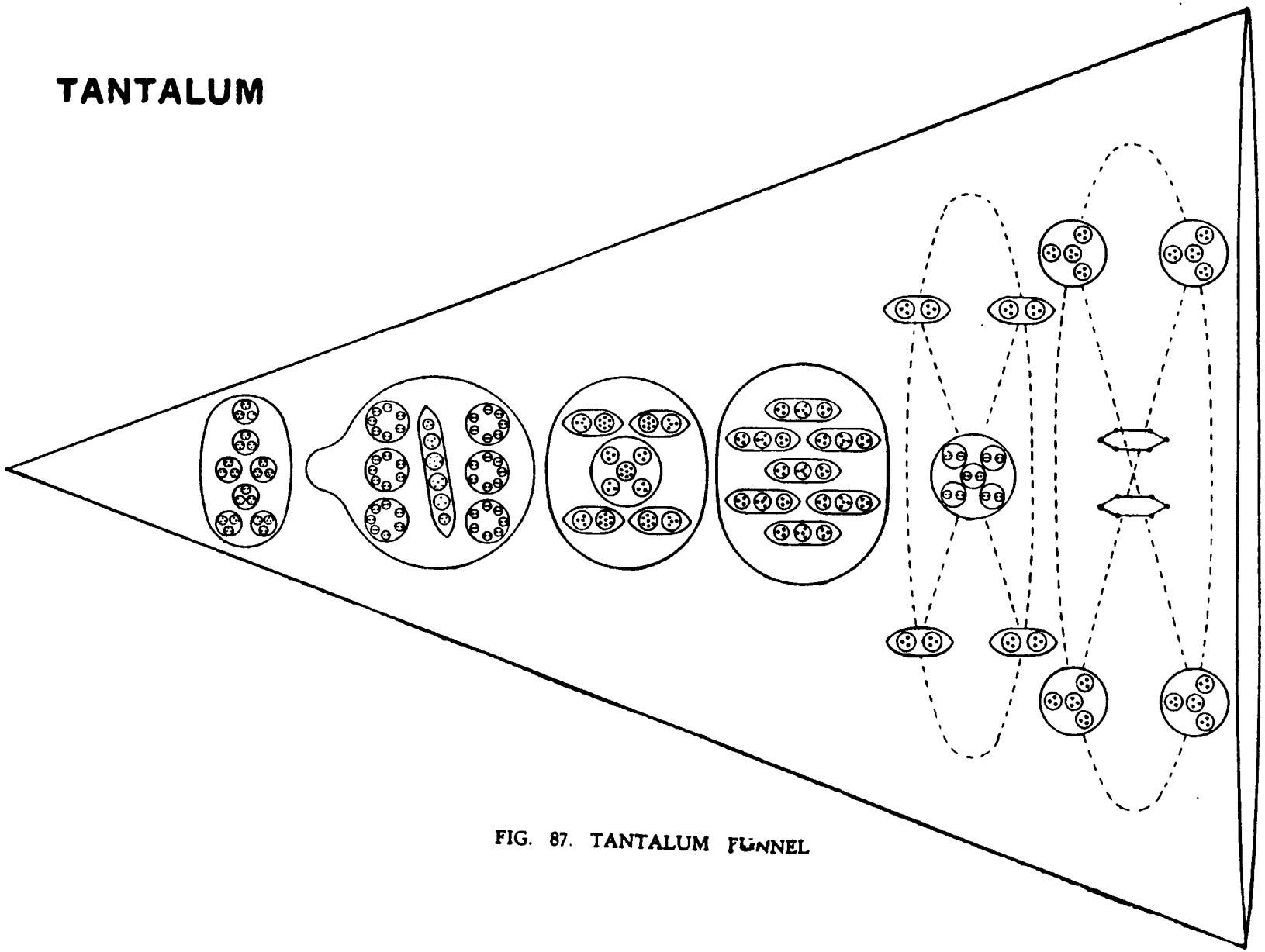


FIG. 87. TANTALUM FUNNEL

ATOMIC NO 73

TANTALUM

Central globe. The central globe is identical with that of Lutecium, Lu819. Fig. 88.

Funnels. Again we find six similar funnels opening on the faces of a cube. Fig. 87. At the bottom of the funnel we find first the N63 group, then N110. Next comes a group peculiar to Tantalum, Ta63; after that we find one of the all pervading Calcium type, Ca70, and then Yt44, and finally Nb60.

Tantalum = Lu819 + 6 [N63 + N110 + Ta63 + Ca70 + Yt44 + Nb60]

Central globe	=	819	Anu
6 funnels of 410 Anu	=	2460	„
Total	=	3279	Anu

Number weight $\frac{3279}{18} = 192.1$

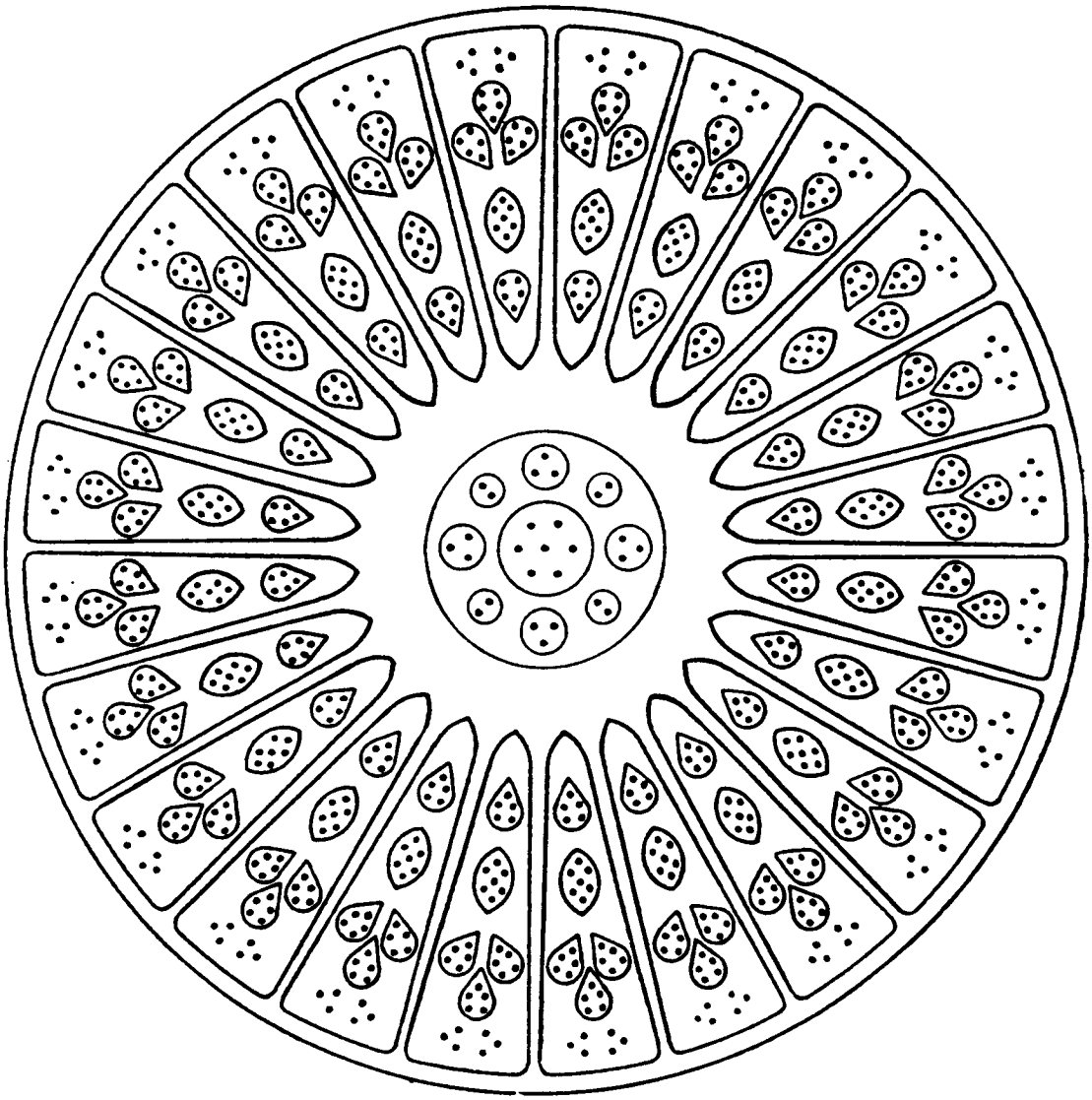


FIG. 88. TANTALUM AND ACTINIUM CENTRE—Lu819