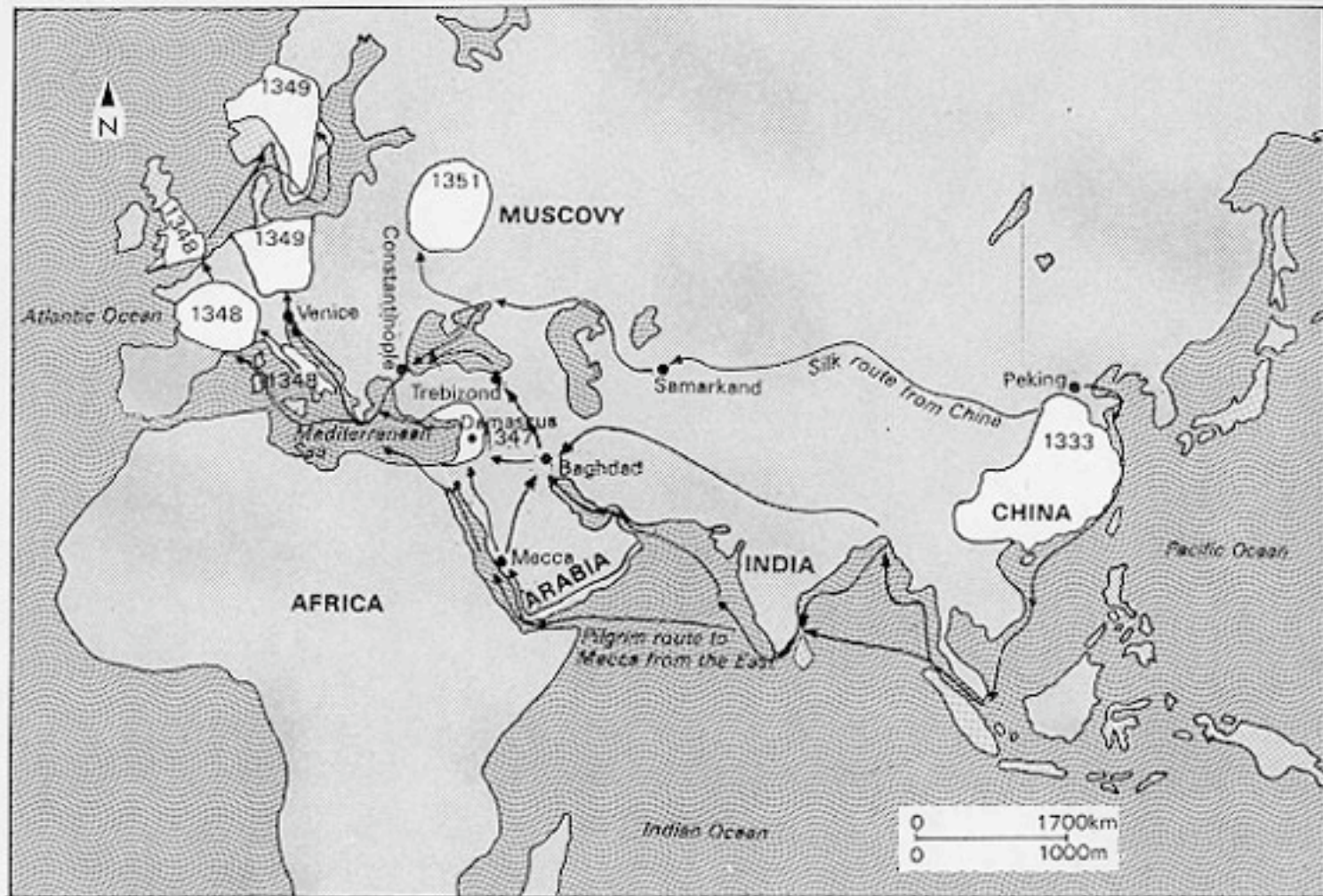
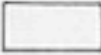
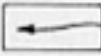


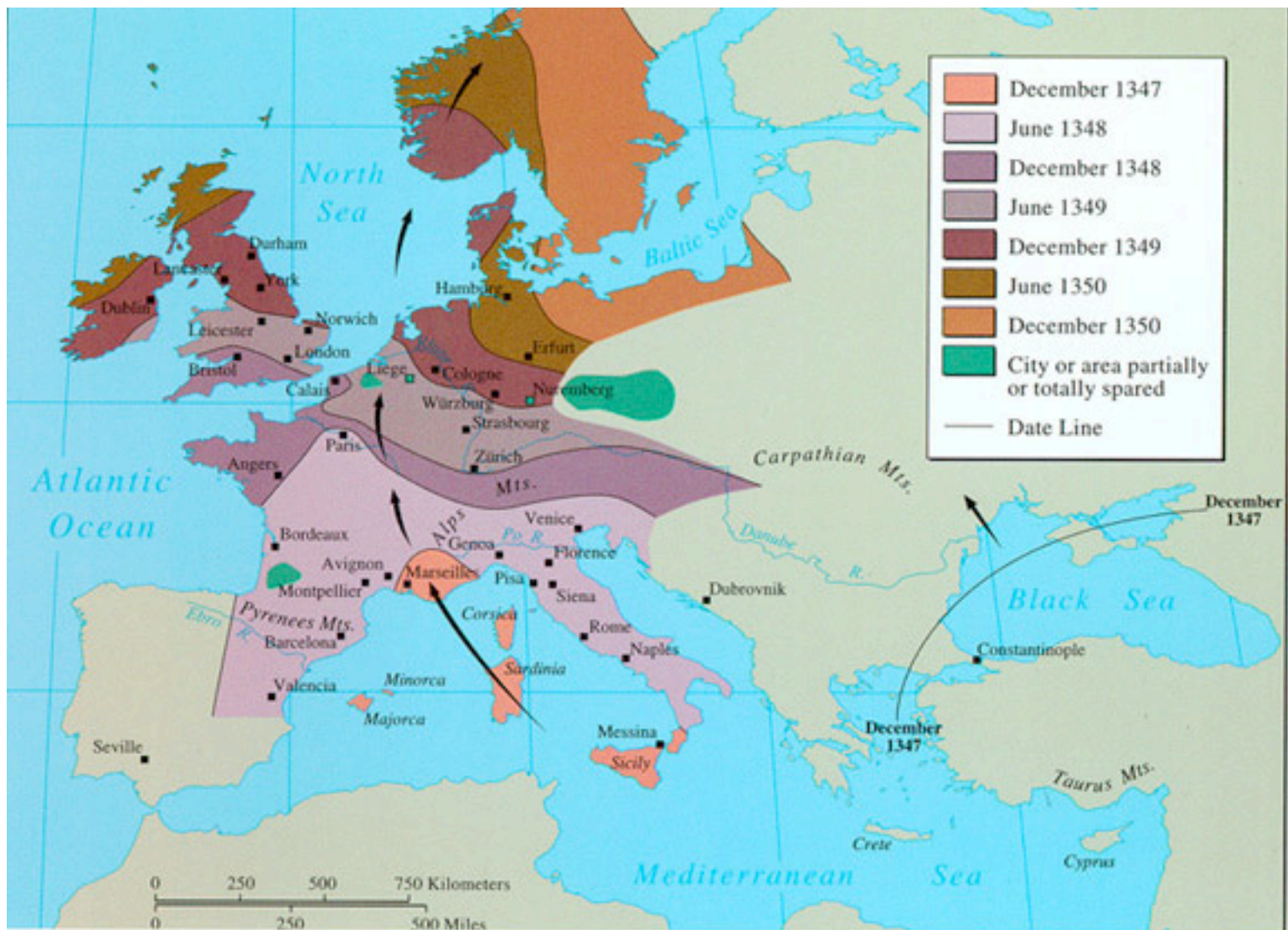
Guangdong province, China



First Incidence of Black Death in Europe and Asia, 1333–1369

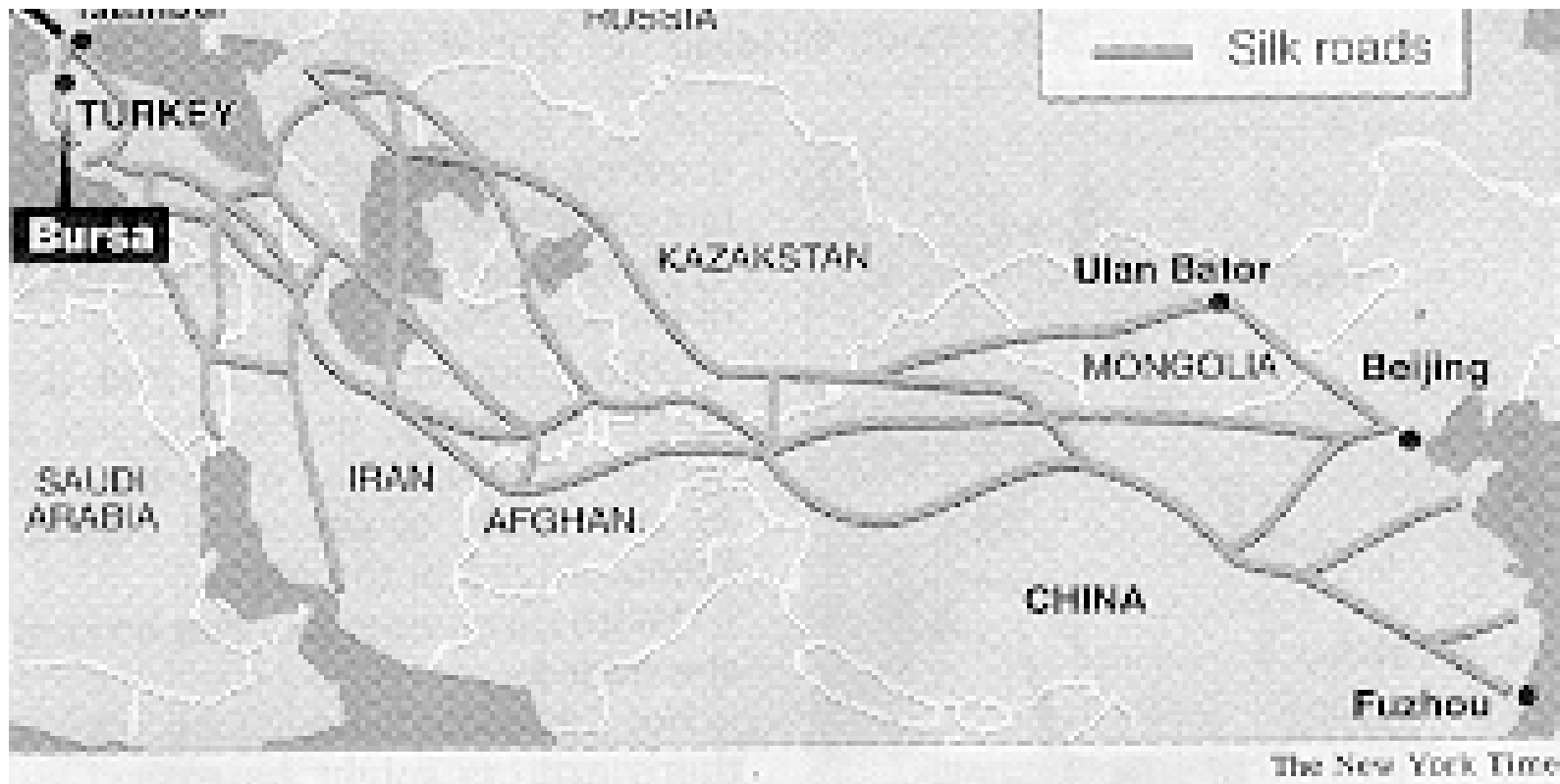


-  Areas of outbreaks of plague, with first known dates
-  Trade routes along which the Black Death spread from China



Map of the Silk Road

- 1] Northern route - Westward to Black Sea**
- [2] Central route - Westward to Persia, Mediterranean Sea, Rome**
- [3] Southern route - Westward to Afghanistan, Iran, India**
- [4] Eastward to Siam**



Siberian marmot



Transmission of *Yersinia pestis*

Blocked versus unblocked fleas

**Uninfected normal male
with fresh bloodmeal**

***Y. pestis*-infected blocked
female. Fresh blood can only be
seen in the esophagus but not
in the midgut which instead
contains dark colored digestion
products from previous bloodmeals.**



from Hinnebusch et al., Science (1996) 273:367



Forms of *Y. pestis* disease-bubonic plague

- ◆ Infection spreads to regional lymph node
- ◆ Bubo (Greek for groin)
- ◆ Bubo(es) very painful due to swelling and bursting 2-6 days after flea bite
- ◆ Formation of bubo preceded by chills, fever, malaise, confusion, nausea, pain in back and limbs
- ◆ Bacteria in blood and organs secrete toxins, cause death





Epidemiology of *Yersinia pestis*

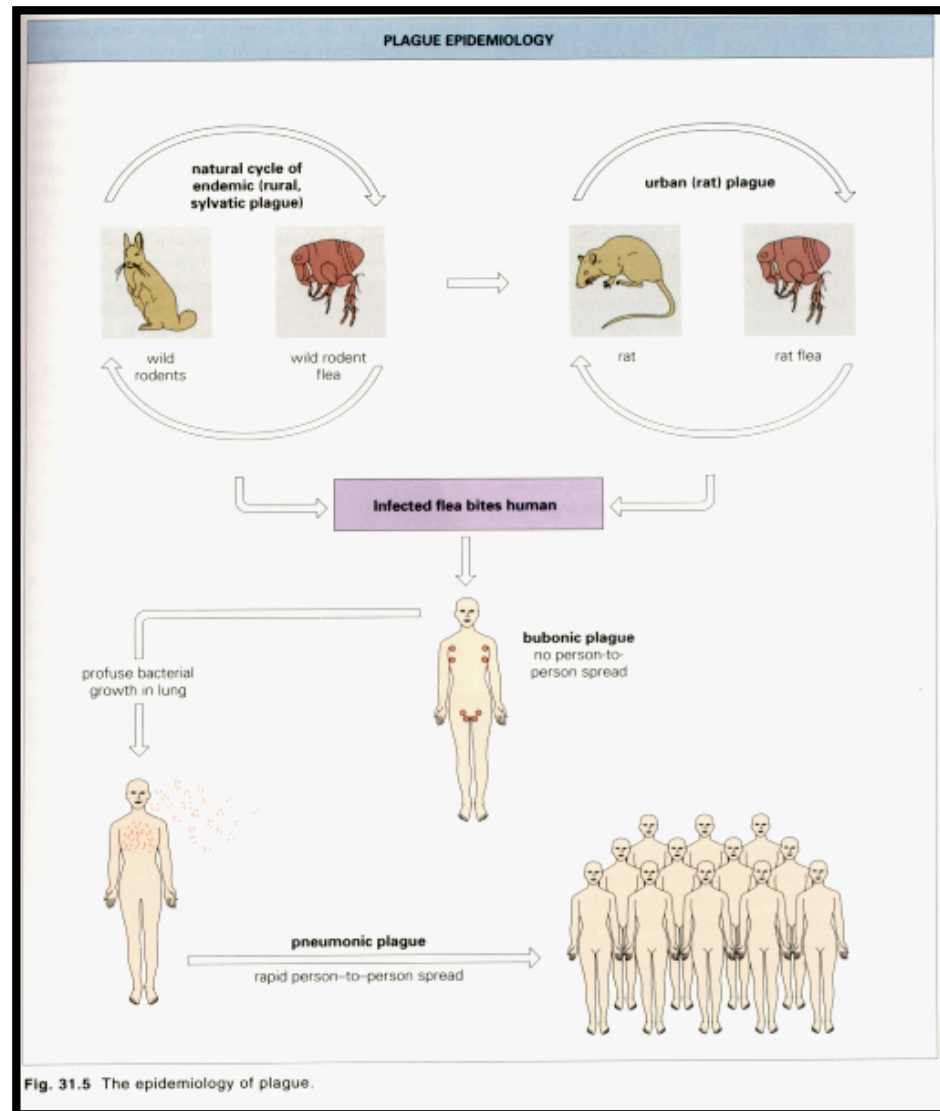
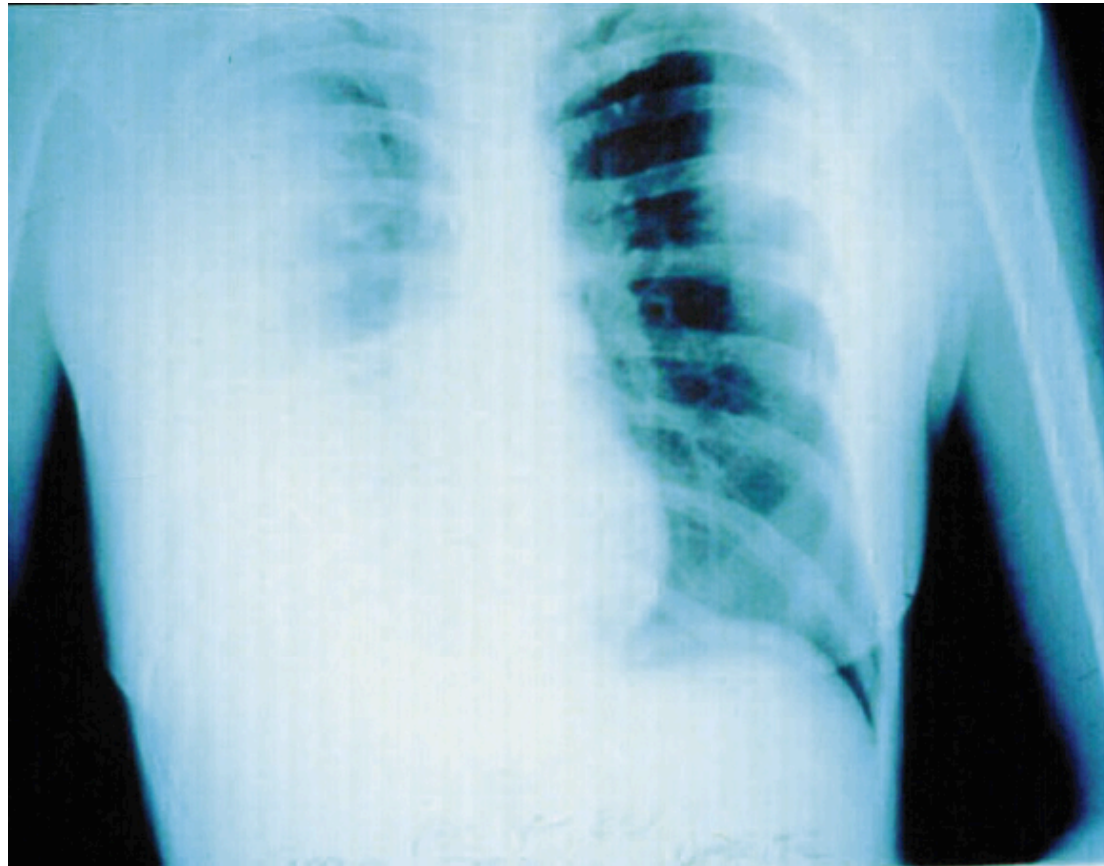


Fig. 31.5 The epidemiology of plague.

Forms of *Y. pestis* disease-pneumonic plague

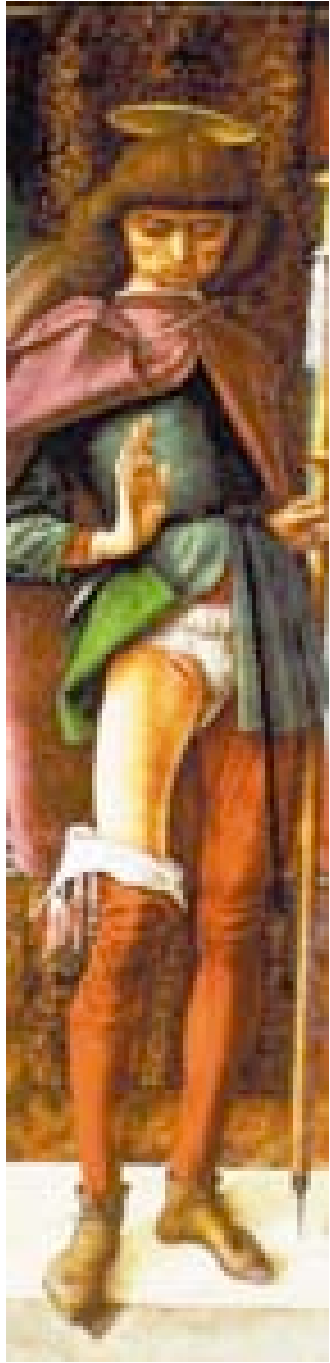


- ◆ *X-ray shows infection in lower left lobe on the 2nd day of infection*
- ◆ **Death within 2 days if untreated**
- ◆ **Convulsions, stupor, delirium**
- ◆ **Highly contagious**

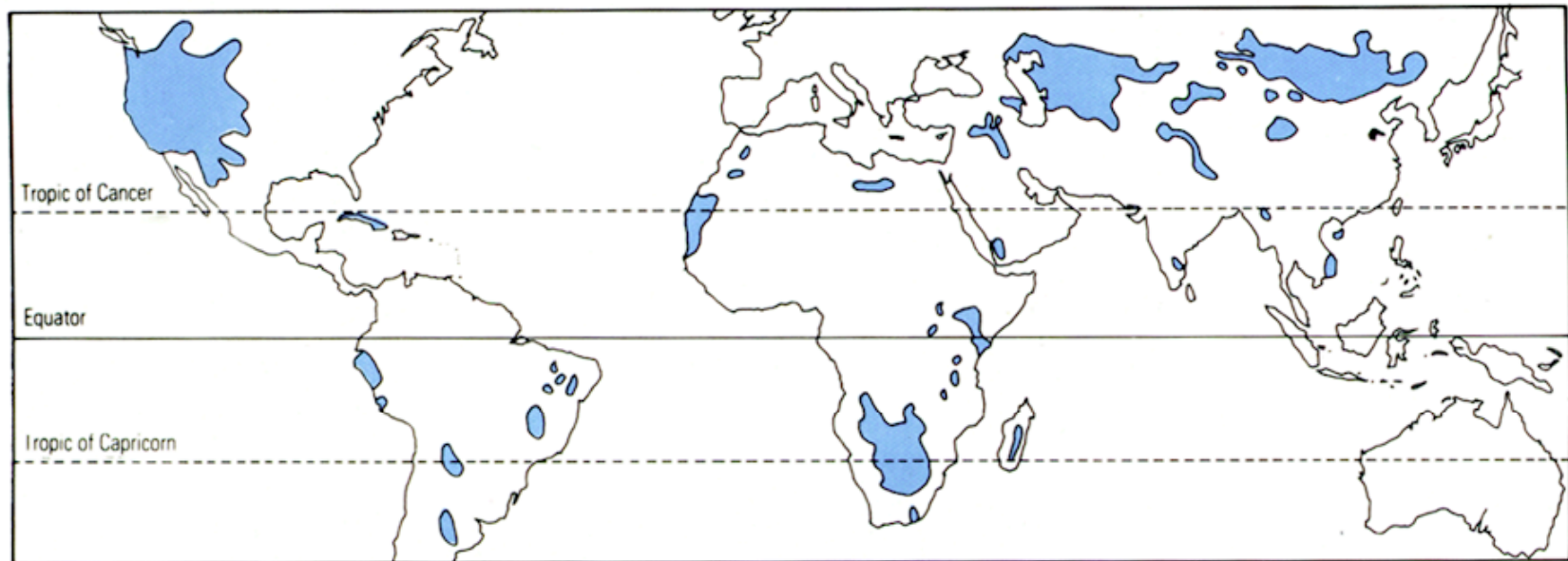








Distribution of *Yersinia pestis*, 2000



36 Known and probable foci of plague Plague is now largely focal in distribution. It spreads rapidly in conditions of war and other catastrophes, e.g. earthquakes. Epidemics still occur from time to time.